

ATARI®

1040ST™
COMPUTER



OWNER'S MANUAL

IMPORTANT INFORMATION

Like any electrical appliance, this ATARI 1040ST Computer uses and produces radio-frequency energy. If not installed and used according to the instructions in this manual, the equipment may cause interference with your radio and TV reception.

If you believe that this equipment is causing interference with your radio or TV reception, try switching the equipment off and on. If the interference problem stops when the equipment is switched off, then the equipment is probably causing the interference. You may be able to correct the problem by trying one or more of the following measures:

- Adjust the position of the radio or TV antenna.
- Reposition the equipment in relation to the radio or television.
- Move the equipment away from the radio or television.
- Plug the equipment into a different wall outlet so that the equipment and the radio or television are connected to different branch circuits.

If necessary, consult your ATARI Computer retailer or an experienced radio-television technician for additional suggestions.

WARNING: This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of the FCC rules. Those rules are designed to provide reasonable protection from interference when the equipment is used in a residential setting. However, there is no guarantee that interference will not occur in a particular home or residence. Only peripherals (computer input/output devices—terminals, printers, etc.) that have been certified to comply with the Class B limits may be attached to this computer. Operation of noncertified peripherals with this computer is likely to result in interference with radio and TV reception. Shielded cables should be used on all I/O connectors (except the joystick and mouse connectors); otherwise, radio emissions may exceed Class B limits.

PLEASE NOTE: Every effort has been made to ensure the accuracy of the product documentation in this manual. However, because Atari Corp. is constantly improving and updating its computer hardware and software, we are unable to guarantee the accuracy of printed material after the date of publication and disclaim liability for changes, errors, or omissions.

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ATARI
1040STTM
COMPUTER

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INTRODUCTION

Only a few years ago, the speed, memory, and graphics power of the ATARI® 1040ST™ Computer were beyond the dreams of most computer enthusiasts. And today, there is no computer that offers the power and performance of the 1040ST at as reasonable a price.

The ATARI 1040ST Computer System combines the latest micro-computer technology with an easily understood and simple-to-use working environment. There are no obscure commands to memorize, nor complicated procedures to follow. Computer operations are represented by pictures and words on the screen; to operate, you simply point to the item and click the mouse button.

The ST™ Computer's operating system, TOS™, has been permanently installed inside the computer—you no longer need to load it from the disk. With over 1,048,576 (1024K) bytes of Random Access Memory (RAM), the 1040ST Computer has the capacity to handle the most complex word-processing tasks and the most detailed spreadsheet procedures. In addition, the 1040ST includes a double-sided, double-density ATARI MicroFloppy Disk Drive that can store up to 726,016 (709K) bytes on each double-sided disk.

The 1040ST Computer offers extensive computing power and potential, including 512 different colors, three screen-resolution modes, an 80-column display, and expansive memory and disk storage. The ease of adding a hard disk, modem, printer, or music synthesizer greatly enhances the ST Computer's potential and allows you to adapt it to new and exciting uses.

How to Use This Manual

Operating your new computer is not difficult; however, you should learn to use it correctly. This manual, designed for computer users from novices to seasoned experts, tells you how to do that. It is intended to be read from beginning to end, proceeding step by step from the simplest to the most advanced operations and procedures.

Most important is that you make a copy of your ST Language disk (Chapter 2) before beginning to work with your computer in earnest. Once you have a backup copy of the disk, you won't have to worry about damaging its contents.

The following outline summarizes the contents of this manual:

Chapter 1, Getting Started, familiarizes you with the parts and features of the computer and how they work. It explains how to unpack the computer and connect the system, and surveys the major features and available options relating to the main unit.

Chapter 2, Operating Your ST Computer: An Overview, introduces you to the GEM™ Desktop and describes how to manipulate it. The chapter also describes how to copy the ST Language disk.

Chapter 3, Icons, Windows, and Files, explains how to manage your information, both on screen and on disk, using the GEM Desktop.

Chapter 4, The Menu Bar, details all Menu Bar headings and the menu options they supply.

Chapter 5, Applications for Your ST Computer, describes the major applications available for your ST Computer, and introduces the two programming languages, ST BASIC™ and ST Logo™, that you received on the ST Language disk.

Appendix A, Troubleshooting and Preventive Maintenance, contains a rundown of problems you may encounter while setting up or operating your ST Computer, and offers solutions. You'll also find helpful hints regarding the care and maintenance of your computer system.

Appendix B, Glossary, defines common technical terms used in association with the ST Computer and within this manual.

Appendix C, 1040ST Specifications, summarizes the major features and requirements of the computer.

Appendix D, Connector Pinout Specifications, details the pin assignments of the ST Computer ports.

Customer Support tells you where to find more information about your ST Computer.

Paragraphs marked **Warning** or **Note** appear throughout the manual. Warnings alert you to potential problems and suggest ways to avoid them. Notes contain useful hints and other information relevant to the topic at hand.

CHAPTER 1

GETTING STARTED

UNPACKING INSTRUCTIONS

Using both hands, carefully lift the computer in its foam packing out of the carton. Remove the foam packing and plastic bag, and place the computer on a firm, level surface. Inside the carton you should find these items:

- ATARI 1040ST Computer
- Mouse
- Power Cable
- ST Language Disk
- 1040ST Owner's Manual
- ST Logo Sourcebook
- ST BASIC Sourcebook

Before going on, make sure you have received all those items. If anything is missing, contact your ATARI Computer retailer.

Note: Save all packing materials for shipping and storing your computer.

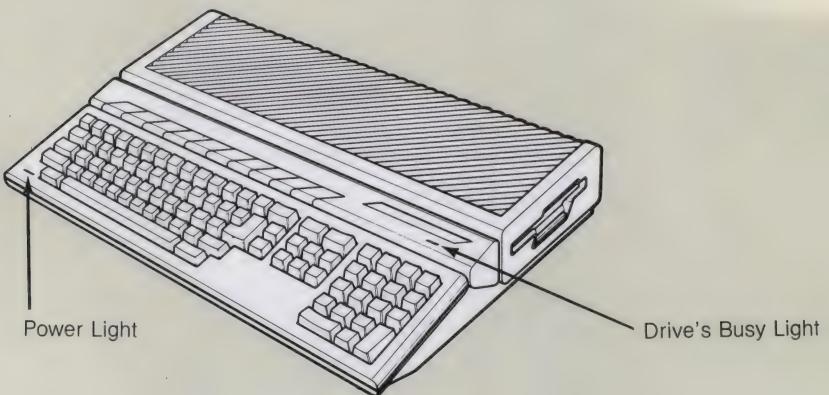
CONNECTING THE SYSTEM

Your 1040ST Computer is a sophisticated piece of electronic equipment and you must choose a proper working environment for the system. Avoid places that expose the components to dust, grease, extreme temperatures, or high humidity. An environment you'd consider suitable for a stereo system or television should also serve your computer well. Arrange the components securely on a firm, level surface, then follow the instructions below.

Note: See Appendix A for information on caring for your ST Computer System.

The Computer and Disk Drive

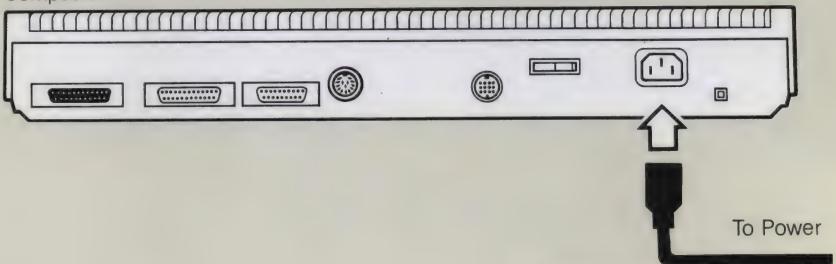
Your 1040ST Computer includes a double-sided, double-density ATARI MicroFloppy Disk Drive built into its right side panel. The disk drive is your primary means of storing and retrieving information. When you connect the power cable to your computer, you are also providing the power source for your disk drive. When the red light on the computer's front panel is illuminated, power to the computer and the drive is switched on. When the drive is "busy" (working to store or retrieve information), the light beside the computer's front panel label illuminates and the drive whirs.



Make sure the computer is switched off. Plug the round end of the power cable into the jack marked "Power" on the back panel of your computer. Now plug the cable's electrical plug into a wall outlet or power strip.

Warning: Be certain to remove the protective cardboard insert from your drive before switching on the power.

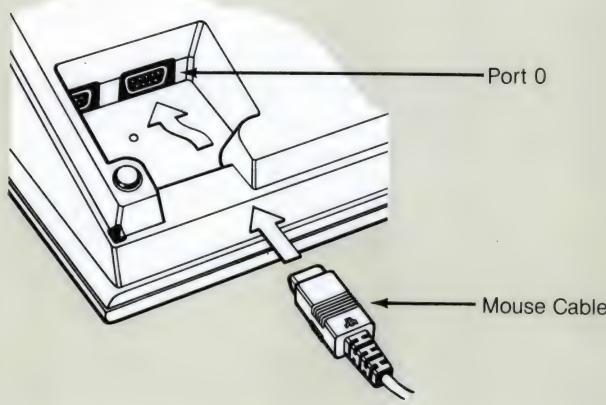
Computer



The Mouse

You will use the mouse to control much of what you do with your computer. You should connect it now.

To connect the mouse, plug its cable into the port marked "0" on the right underside of the computer.



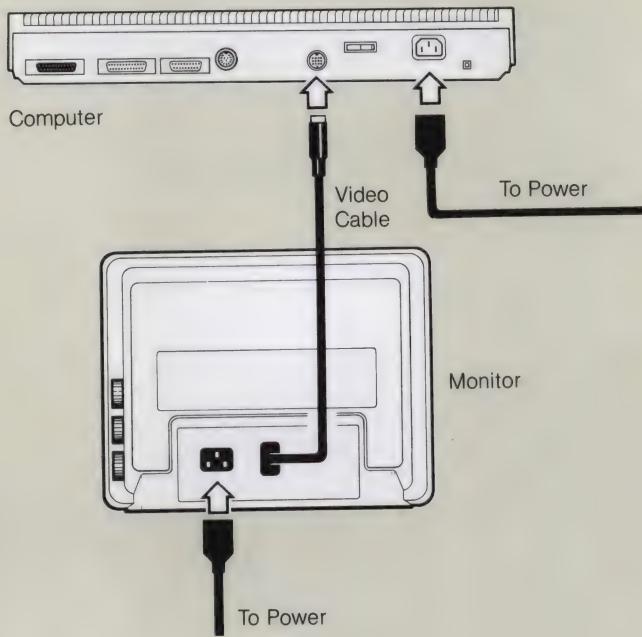
The Video Display

Without a video display screen your computer has no way of communicating with you, nor can you effectively communicate with it. The display screen allows you to see what's going on.

Monitor

If you have an ATARI SM124™ High-Resolution Monochrome Monitor, plug its video cable into the jack labeled "Monitor" on the back of the computer. Connect the monitor's power cable and plug it into a wall outlet or power strip.

If you have an ATARI SC1224™ RGB Analog Color Monitor, plug one end of its video cable into the jack labeled "Signal Input" on the monitor. Plug the other end into the jack labeled "Monitor" on the back of the computer. Connect the monitor's power cable and plug it into a wall outlet or power strip.



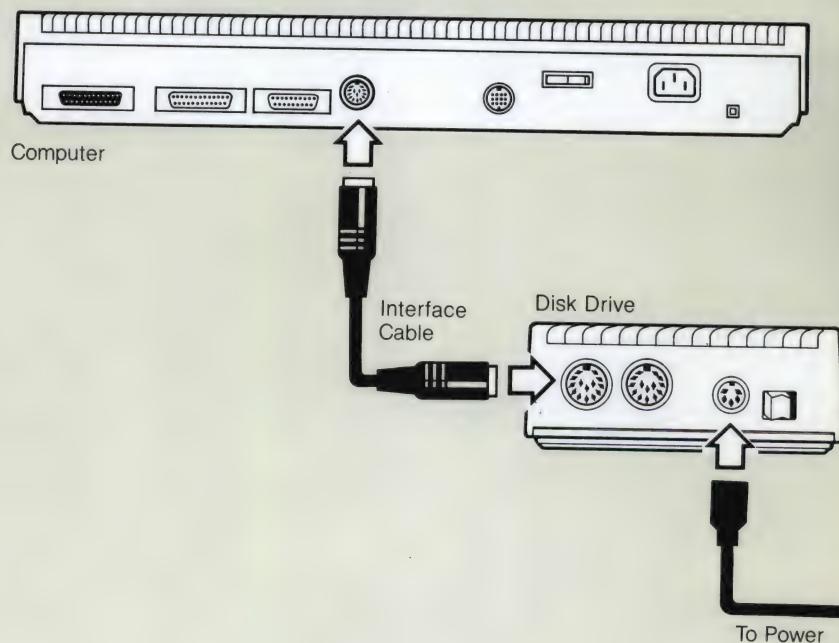
Note: Consult the manual that came with your monitor for further information.

A Second Disk Drive

In addition to the disk drive built into your computer, you may connect an additional drive to your computer system. A second drive enhances the convenience of data storage and retrieval.

To connect a second disk drive, follow these steps:

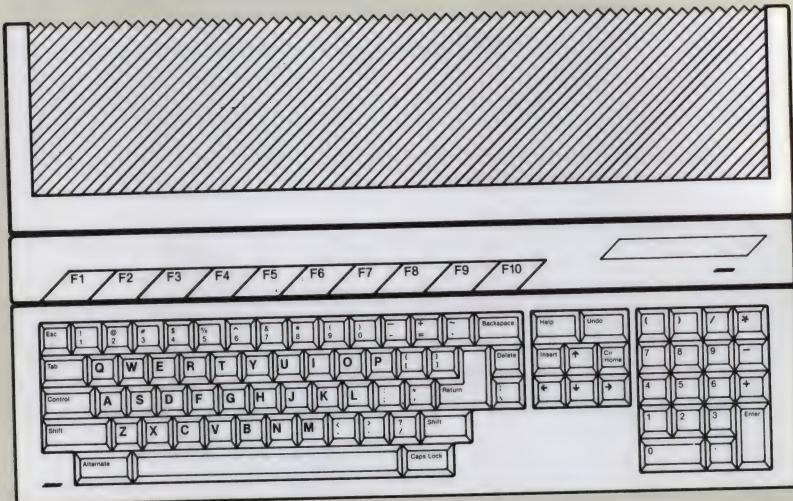
1. Make sure the computer is switched off, then plug one end of the drive's interface cable into the jack labeled "Floppy Disk" on the back of the computer. Plug the other end into the port marked "In" on the back of the drive.
2. Make sure the disk drive is switched off, then insert the AC power adapter's round plug into the jack labeled "Power" on the back of the disk drive. Insert the power adapter's two-pronged electrical plug into a wall outlet or power strip.



Note: You can connect a maximum of one external floppy disk drive to your 1040ST Computer. The system always refers to your internal drive as Drive A. Your external drive is Drive B.

POR TS AND FEATURES

The Keyboard



The central part of your 1040ST Computer keyboard is arranged much like a conventional typewriter keyboard. This is because much of what you'll do with the computer will involve typing; for instance, writing letters or reports. These keys function just as on a typewriter. The [S] key produces the letter "s" on your screen; pressing [Shift] [S] produces the capital letter "S."

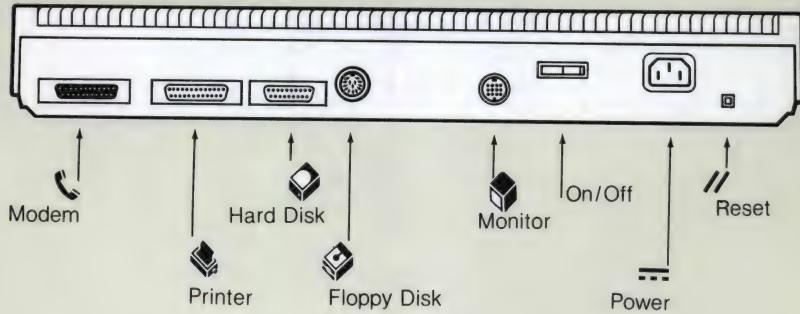
But computers aren't exactly like typewriters. Because they are not mechanical, they require special keys to replace those keys on a typewriter that perform mechanical functions. One example is the [Return] key on your computer keyboard. It replaces the carriage return lever (or key) on a typewriter, and returns you to the screen's left margin; it's also often used to confirm responses or commands that you enter into the computer. Another example is the computer's set of cursor ("arrow") keys. The cursor is a graphic point on the screen that keeps your place when you type with the computer. The cursor keys allow you to control the movement of the cursor on your screen.

Note: Throughout this manual, letters or words enclosed by square brackets ([]) represent keys on your ST Computer keyboard. Some functions require that you simultaneously press two or three keys; in that case, the keys are listed serially.

Because computers are electronic they are more versatile than typewriters. For instance, on the far right is the keyboard's calculator keypad. The keys are arranged in standard calculator fashion for convenience and speed in number-oriented work. Further, because so much more can be done with a computer than with a typewriter, your keyboard must include keys you'd never find on a typewriter, such as the [Esc], [Control], and [Alternate] keys.

The [Esc], [Control], and [Alternate] keys work much like the [Shift] key, in that they often change the meaning of a second key to produce special instructions or codes. Along the top of the keyboard are the Function keys, [F1] through [F10]. These keys have no set meaning, though many software applications use them to perform special operations.

The Back Panel



Modem

Any industry-standard RS232 modem may be connected to your computer through this port. Run the modem's interface cable from the modem to this port. Your computer uses a modem to transmit and receive information to and from other computers via a telephone line. With a modem in your system you can hook into a variety of electronic information and mail services, communicate with the computer at work, or talk to a friend's computer. You can also connect a serial printer or any other RS232 device through the Modem port.

 **Printer**

An ATARI ST Printer connects to your computer through this port. Connect the interface cable that came with your printer to this port, then to the printer. The Printer port is an industry-standard parallel interface, so almost any parallel printer can be attached here.

 **Hard Disk**

An ATARI Hard Disk Drive attaches to your computer through this port. Simply connect the interface cable that came with your hard disk to this port, then to the hard disk. A hard disk drive can store much more information and transmit that information much faster than a floppy disk drive. Your hard disk drive is Drive C.

 **Floppy Disk**

A second disk drive can be connected to your ST Computer through this port.

 **Monitor**

An ATARI SC1224 RGB Analog Color Monitor or an ATARI SM124 High-Resolution Monochrome Monitor can be attached to your computer through this jack.

 **On/Off**

This switch turns the computer on and off.

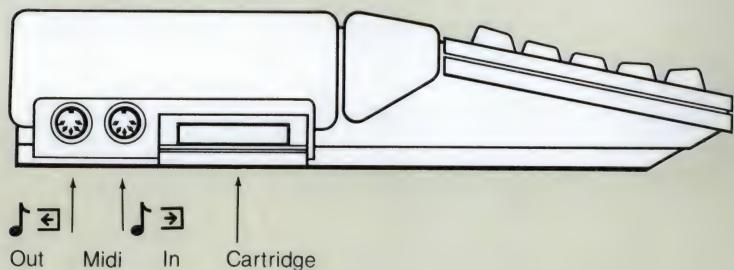
 **Power**

This plug connects the computer to the power source.

 **Reset**

This button restarts the computer without switching it off and on. Restarting the computer this way is known as a "warm" start.

The Left Side Panel



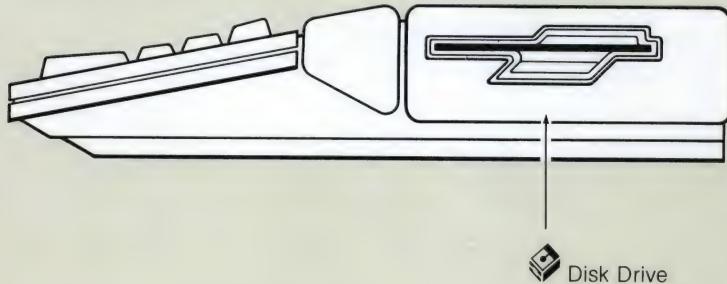
Midi Out/Midi In

MIDI stands for Musical Instrument Digital Interface. These two ports give your computer access to the latest generation of electronic musical instruments. The Midi In port allows the computer to monitor a synthesizer or any other MIDI-equipped instrument. The Midi Out port lets the computer control an instrument's digital interface, letting you play complex compositions while changing the volume, tempo, and instrumentation. Using the MIDI interfaces, your computer can become a sophisticated studio recorder that lets you create music one track at a time.

Cartridge

Software programs for ST Computers that come in cartridge form are inserted in the cartridge slot. Cartridge programs load instantly, and because they are external, they do not use any of the computer's memory in order to load. Up to 131,072 (128K) bytes of program information can be contained on a single cartridge. The system treats the cartridge as Drive c.

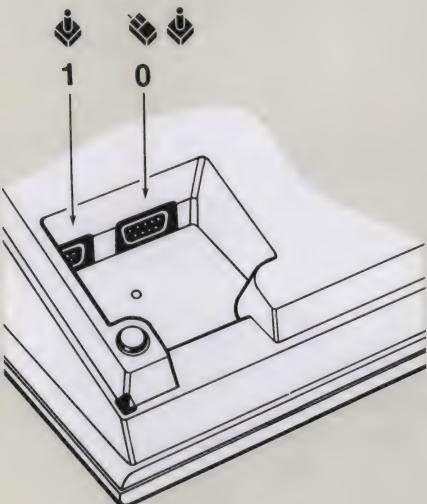
The Right Side Panel



Disk Drive

The built-in ATARI MicroFloppy Disk Drive is double-sided and double-density, capable of storing 360 kilobytes of information per side.

The Right Underside



Mouse & Joystick

The mouse connects to your computer through the Mouse/Joystick port 0. ATARI-compatible joysticks can also be connected through either port 0 or 1. Joysticks are used when playing computer games; they allow you to control the action of the game on the screen.

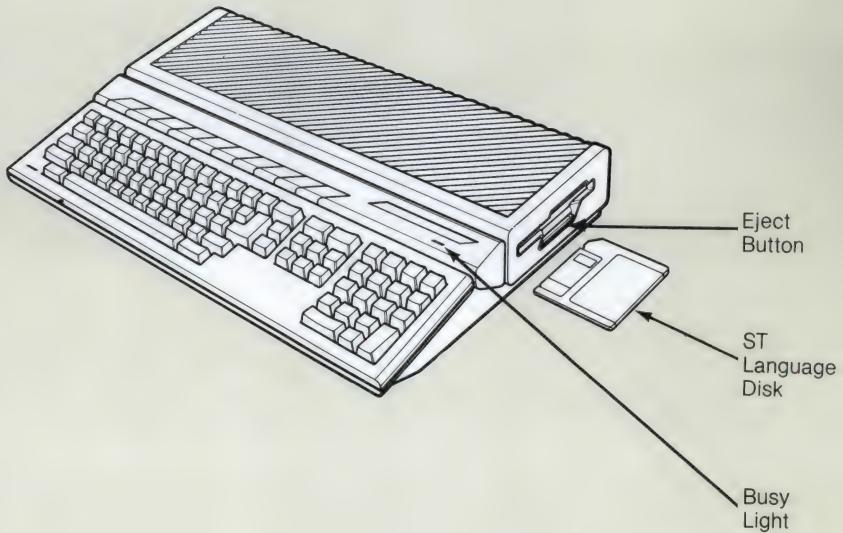
CHAPTER 2

OPERATING YOUR ST COMPUTER: AN OVERVIEW

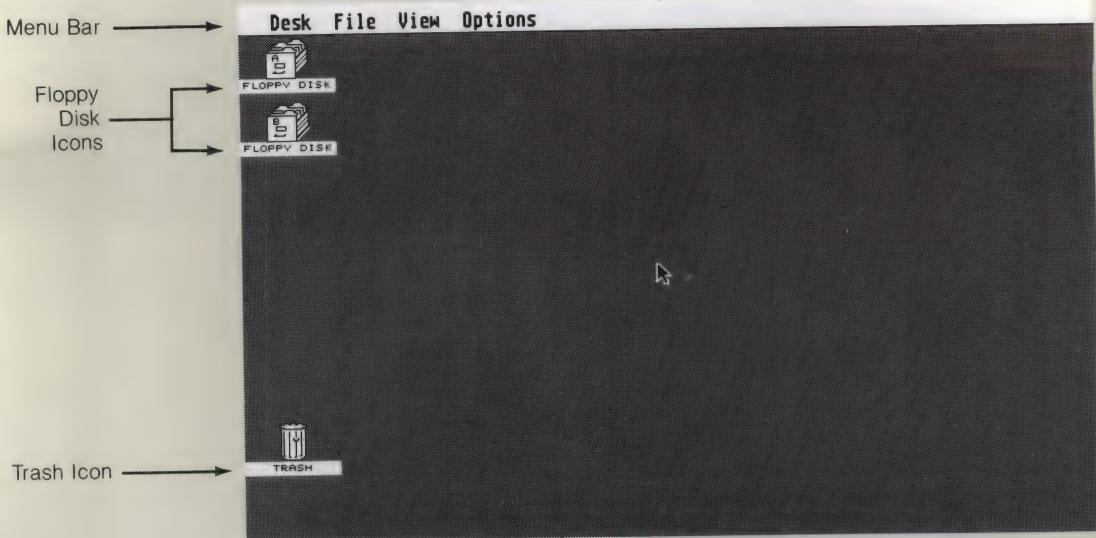
SWITCHING ON THE SYSTEM

Once you have connected all the components, you are ready to switch on the power to your computer system. Follow these steps:

1. Hold the ST Language disk by its plastic casing with the label facing up and the metal end towards the slot on the disk drive. Slide the disk gently forward into the drive opening until it clicks into position. The disk should be completely inside the drive when properly installed.



2. Switch on your monitor, your external drive (if you have one), then your computer (always switch your computer on last). The drive's busy light goes on and the drive whirs, while the Bee icon appears and some of the disk's information loads into your computer. (Whenever the computer transfers or retrieves information from the disk drive, the screen displays the Bee icon.) After a few moments your screen looks like this:



This is the GEM Desktop. It is the starting point for almost everything you do with your ST Computer. As you become acquainted with your computer system, the GEM Desktop and its features will serve as an important point of reference for you.

Note: If the desktop fails to appear on your screen, switch the computer off and make sure that your video display is switched on, that the ST Language disk is correctly inserted inside the drive, and that all cable connections are proper and secure. Try switching the system on again. If the problem persists, refer to Appendix A.

WHAT IS GEM?

GEM stands for Graphics Environment Manager, which is just a fancy way of saying that the desktop conveys and manages information by means of graphic images and words instead of words alone. The opening screen display is called the "Desktop" because it's graphically modeled to imitate and function as one's home study or office desk.

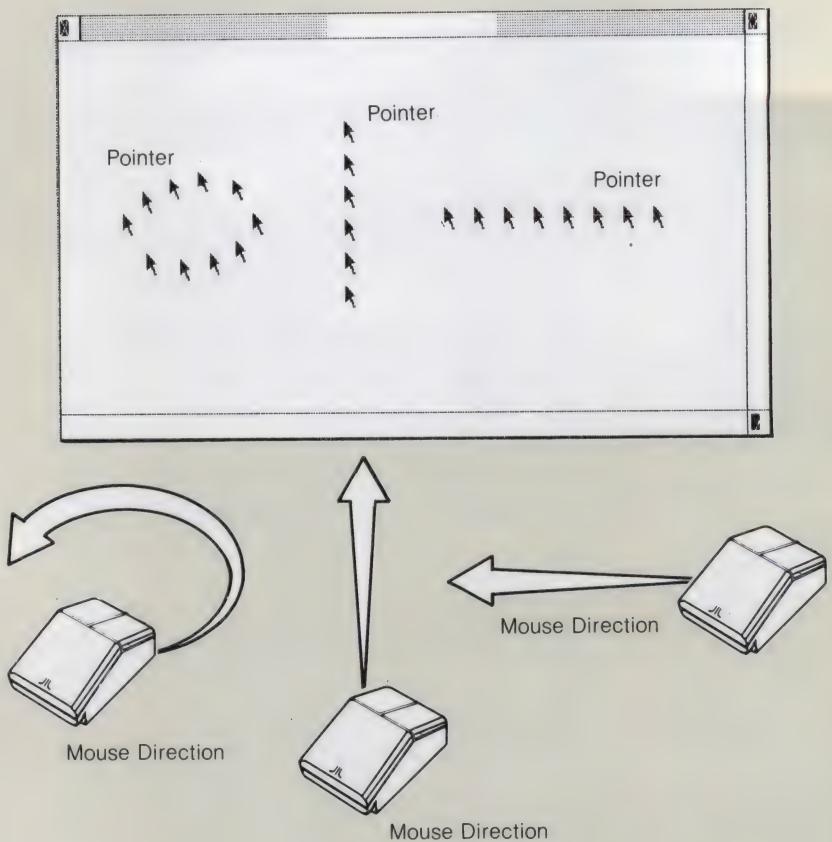
The GEM Desktop consists of the Menu Bar along the top of the screen, three icons (pictures) along the left side, and the remaining screen space. The Menu Bar gives you access to the utilities and applications available from the GEM Desktop. The Floppy Disk icons allow you to control and manipulate the information stored on your disks. And the Trash icon lets you dispose of your unwanted information. (See Chapter 3 for an explanation of the Floppy Disk and Trash icons. See Chapter 4 for a detailed presentation of the Menu Bar and its contents.)

CONTROLLING THE MOUSE

The mouse is the main device for moving around and manipulating the desktop. As you can see, the mouse is a small, rectangular box with two buttons on top, a ball underneath, and a cable running from the mouse to Mouse/Joystick port 0 on the computer.

The mouse detects motion (direction, distance, and speed) through the movement of its ball as it rolls over your working surface. On the screen a small arrow called the "mouse pointer" mirrors the movement of the mouse. The mouse allows you to position its pointer anywhere on the GEM Desktop. You use the left mouse button to "select" items on the desktop; you will always use the left button within the desktop. The right mouse button is used with some application programs.

To understand further how the mouse operates, situate it on a flat, clean surface (your computer desk or tabletop) so that the side with the cable is facing the screen. Now move the mouse around—left, right, forward, backward, in circles. Practice moving the pointer around the desktop so you get the feel of the mouse and how it controls the pointer's movement.



Pointing and Clicking (Selecting)

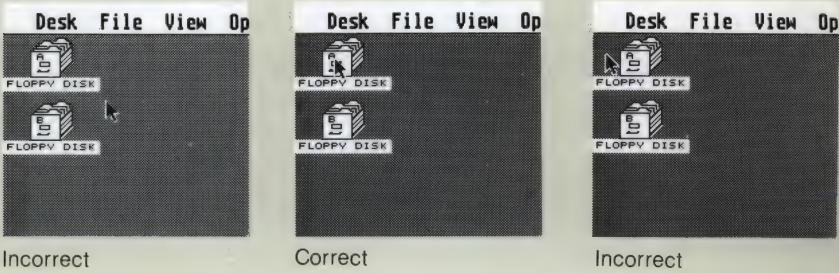
When you "select" an item on the GEM Desktop, you tell the computer that you want to do something with the file or function that the item represents. Use the mouse pointer to point at the item you wish to select. Then select the item by "clicking" the left mouse button.

Note: To customize the clicking rate and responsiveness of the mouse button, see "Control Panel" in Chapter 4.

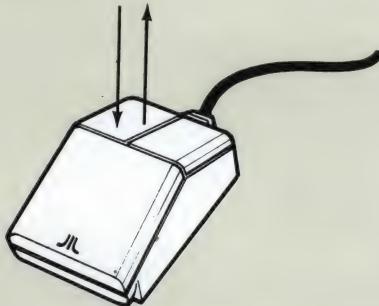
Selecting an Icon

To point at an icon, position the tip of the pointer on that icon.

Positioning the Mouse Pointer



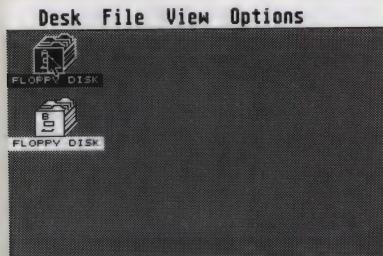
To select an icon, click and immediately release the left mouse button.



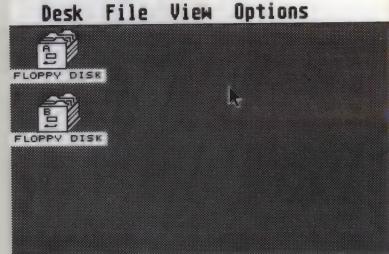
Try pointing at and clicking on one of the icons. When you click on an icon, it reverses shading (highlights) to indicate that it has been selected.

To cancel your selection, move the pointer anywhere else on the GEM Desktop and click the left mouse button. Selecting a second icon before cancelling the first selection automatically cancels the first selection. (See "Multiple Selections" in Chapter 3 for techniques on selecting more than one item at a time.)

Selecting an Icon



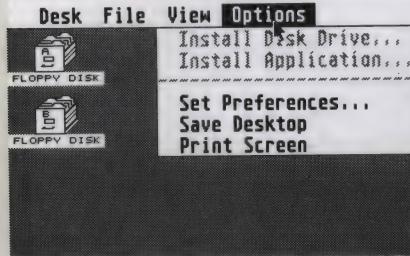
Cancelled the Selection



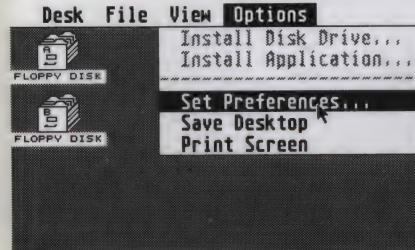
Selecting a Menu Heading and Option

To point at a menu option, move the pointer to one of the Menu Bar's headings. The appropriate menu immediately drops down. Now move the pointer to the menu option you want to select. Notice that the items reverse shading as you point at them. To select a menu option, click on that option when it's highlighted.

Positioning the Mouse Pointer on a Menu Bar Heading



Positioning the Mouse Pointer on a Menu Option

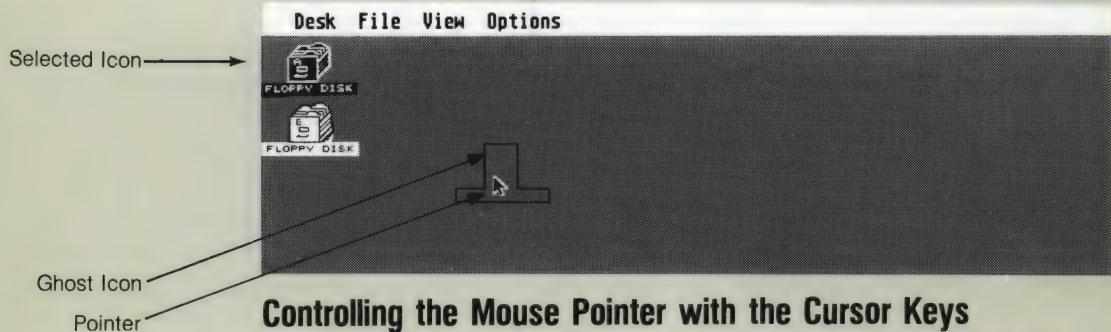


To cancel without making a selection, move the pointer outside the menu and click the left mouse button. Also, moving to a second menu automatically cancels the first menu.

Dragging

Another important mouse technique is "dragging." When you drag an icon you move it from one place to another on the desktop. To drag an icon, select it, then press and hold the left mouse button while you move the mouse pointer. A "ghost" (outline) of the icon follows the pointer. When you release the button, the icon jumps to its new location, appearing at the last position of the ghost icon.

You'll discover many uses for dragging icons from one area to another on the desktop, but for now try dragging the icons from place to place around and about your screen. In this way, you can rearrange the layout of the desktop according to your preference.



Controlling the Mouse Pointer with the Cursor Keys

You can also use the cursor keys to move the pointer around the desktop. The list that follows shows the keystroke combinations that control the pointer's movement on screen without using the mouse.

[Alternate] [any cursor key] moves the pointer eight pixels (screen dots) in the direction indicated by the cursor key.

[Alternate] [Shift] [any cursor key] moves the pointer one pixel.

[Alternate] [Insert] selects an icon. This combination is the same as pressing the left mouse button.

[Alternate] [Insert] [any cursor key] drags an icon.

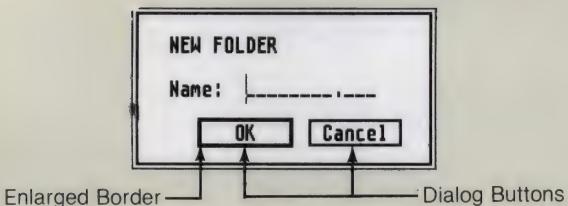
[Alternate] [Clt Home] performs right mouse button functions.

Note: To adjust the speed and responsiveness of the cursor keys, see "Control Panel" in Chapter 4.

DIALOG BOXES AND ALERT MESSAGES

Dialog Boxes

Whenever the ST Computer needs to communicate with you, it displays a Dialog Box at the center of the GEM Desktop. Dialog Boxes establish a dialog between you and the computer. For example, the Dialog Box below requests information from you so that a certain procedure may be completed.

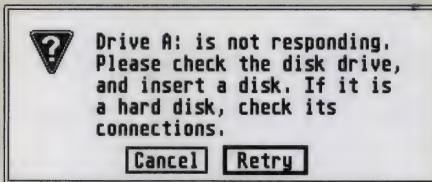


To execute your action from a Dialog Box, point at one of the Dialog buttons and click the left mouse button. If a Dialog button has an enlarged border, you can simply press [Return] on the ST Computer keyboard rather than clicking on that button.

Alert Messages

Alert Messages are Dialog Boxes punctuated with stop signs, question marks, or exclamation points. Alert Messages warn you that the operation you are performing or about to perform has potentially dire consequences, or that it is improper or impossible.

When you see an Alert Message, such as the one below, follow its instructions and click on the dialog button inside.



MAKING A BACKUP ST LANGUAGE DISK

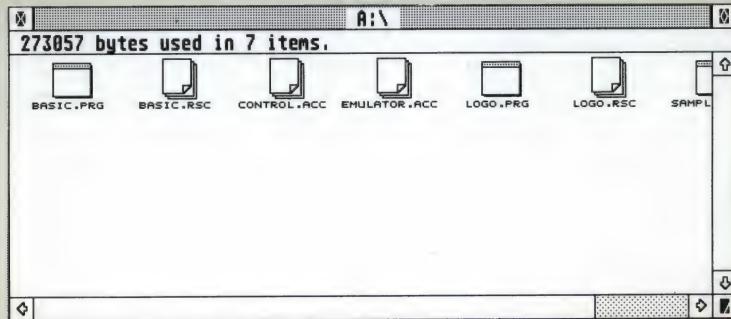
Before you go any further, it is imperative that you make a backup copy of your ST Language disk. If something should happen to the ST Language disk that came with your system, you would be unable to access many of the desktop's features.

To make a backup of your ST Language disk you will need a new, blank, 3½-inch disk. (The disk may be either single- or double-sided, but it must be a double-density disk.) Disks can be purchased at any computer retailer. The duplication procedure is simple, and will begin to acquaint you with the workings of the GEM Desktop.

What's on the ST Language Disk?

Before you begin the duplication procedure, take a look at what's on the ST Language disk. As you will see, the ST Language disk contains recorded information arranged in files. To view the files on the disk, follow these steps:

1. With the ST Language disk in your built-in drive (Drive A) and the GEM Desktop displayed, point at the Floppy Disk A icon and click the left mouse button (you are "selecting" Drive A).
2. Point at the File heading on the Menu Bar, then move the pointer until the word "Open" reverses shading. Click the left mouse button once (you are "selecting" the Open utility).
3. Your "window" to the contents of Drive A now opens. The disk's files are displayed as icons; each file (icon) has a name. Just take a moment to see that indeed there are files on your ST Language Disk.



4. Now close Drive A's window. Move the pointer to the File heading once again. Move down the menu until "Close" reverses shading, then click the left mouse button. Drive A's window disappears.

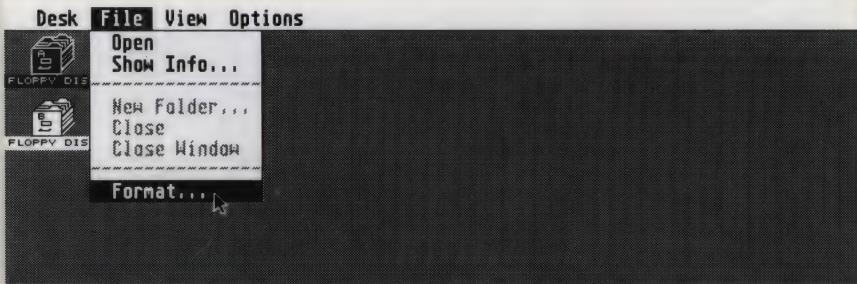
How to Format Your Blank Disk

Before you copy the ST Language disk, you must prepare the blank disk to receive information. This procedure is called "formatting." To format your blank disk, follow the steps below and read the prompts that appear in the Dialog Boxes on your screen.

1. If you have one disk drive, remove the ST Language disk from your drive by pressing the drive's eject button. Place the ST Language disk aside, and insert your new blank disk into the drive.

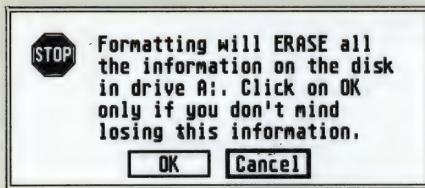
If you have two disk drives, insert the ST Language disk into Drive A and the blank disk into Drive B (your external drive). With two drives, you can keep the ST Language disk in Drive A and the blank disk in Drive B during the formatting and duplication processes.

2. If you have one drive, select the Floppy Disk A icon, then select Format from the File heading on the Menu Bar (click on Format).

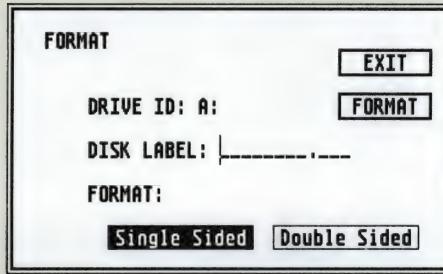


If you have two disk drives, select the Floppy Disk B icon, then select Format from the File heading on the Menu Bar (click on Format).

3. The GEM Desktop now displays the following Alert Message:

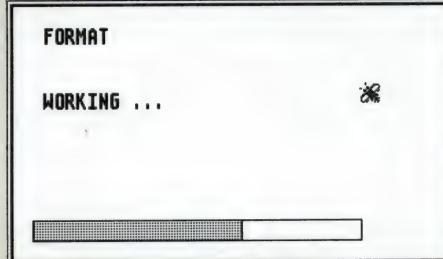


As a safeguard, this message warns you that formatting will erase any information previously stored on the disk. Since you are beginning with a blank disk, the warning doesn't apply. Click on the OK button and proceed to the Format box.



4. Make sure the single-sided box is shaded, then click on the Format button. (Do not name your disk.)

5. While the disk is being formatted, the computer monitors the process in the Format Working box.



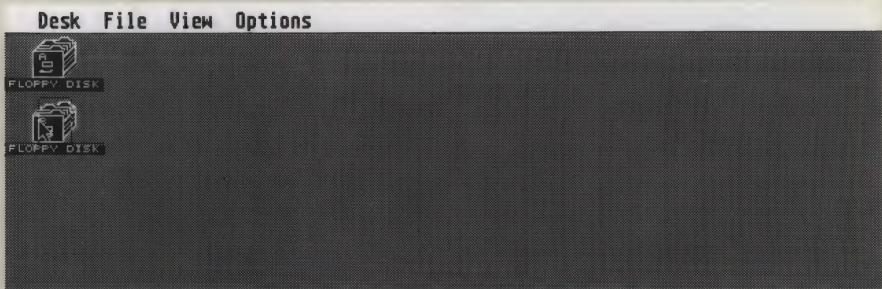
Your blank disk is now formatted and can hold 357,376 bytes of information, which is more than enough to copy the ST Language disk. Click on the OK button. You will return to the Format box. Click on the Exit button to return to the GEM Desktop.

Note: If the formatted disk cannot hold 357,376 bytes of information, the disk may be defective. Try formatting it again. If the problem persists, place a new disk in the drive and format it.

How to Copy the ST Language Disk

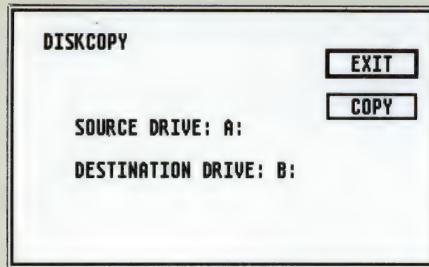
To copy the ST Language disk to your now formatted blank disk, follow these steps. If your ST Language disk has a write-protect tab, move it to the open (protected) position (see page 21).

1. If you have one disk drive, insert the ST Language disk into the drive, select Floppy Disk A with the mouse pointer and drag it on top of the Floppy Disk B icon. When the Floppy Disk B icon reverses shading, release the left mouse button. (If you are working with one disk drive, copying to Disk B simply means that your drive will function as both Drive A and Drive B in the duplication process.)

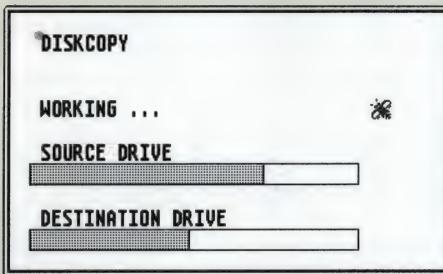


If you have two disk drives, be sure the ST Language disk is in Drive A (your internal drive) and the formatted disk is in Drive B (your external drive). Then select Floppy Disk A with the mouse pointer and drag it on top of the Floppy Disk B icon. When the Floppy Disk B icon reverses shading, release the left mouse button.

2. As a precaution, you will see an Alert Message warning you that copying Disk A to Disk B erases all information on Disk B. Again, since you are beginning with a blank disk, the warning doesn't apply. Click on the OK button. You now see the Diskcopy box.



Click on the Copy button and follow the prompts to finish the copying process. You will be instructed to switch disks, if working with one disk drive, until the copying process is complete. The computer monitors the duplication process in the Diskcopy Working box.



The "source" disk is the disk you are making a copy of. The "destination" disk is the disk you are copying to.

3. When the procedure is complete, you will see the Diskcopy box again. Click on the Exit button to return to the GEM Desktop. Put the original ST Language disk in a safe storage place. Using a stick-on paper label, label the copy's plastic housing "Working ST Language." From now on, use your Working ST Language disk whenever using your computer.

Note: You were previously instructed not to name your newly formatted disk in the Format box because making a disk-to-disk copy erases all information on the destination disk, so the effort would have been pointless. Under other circumstances you may of course name disks in the Format box. For more information, see "Copying Files" in Chapter 3 and "Format" in Chapter 4.

DISKS AND YOUR DISK DRIVE

Most of the information you load into your ST Computer will be stored on 3½-inch microfloppy disks. Disks and your disk drive enable you to load information into the computer, as well as store programs and other information that you create with your ST Computer.

Note: See Appendix A for information on caring for your disks and disk drive.

Single-Sided/Double-Sided

The disk drive built into your ST Computer is a double-sided drive, which means that it can record and read information on double-sided disks. Double-sided disks store information on two sides. This feature greatly enhances storage capacity, allowing up to 726,016 bytes of information on one disk. You must use double-sided disks when using the double-sided format option.

Your drive will also accept single-sided disks, which have only one recordable side. It is important that your drive be able to do this because most commercial software programs for your ST Computer will be on single-sided disks. You may format double-sided disks in the single-sided format, but the disk's other side will be unable to record any data.

You cannot directly copy a single-sided disk to a disk that has been formatted as a double-sided disk, nor vice versa. The ST Language disk that came with your system is single-sided. That is why you had to format your blank disk as single-sided, even though your drive is double-sided and the new disk you used may have been double-sided. To find out how to get the information from a formatted double-sided disk to a formatted single-sided disk (and vice versa) see "Copying Files" in Chapter 3 and "New Folder" in Chapter 4.

Double-Density

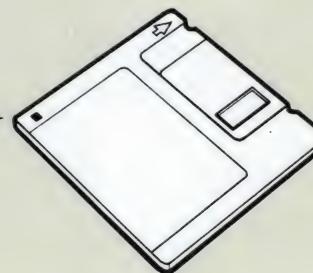
Not only is your drive double-sided, it also records in double-density. This means that you must use double-density disks, whether you format single- or double-sided. Most 3½-inch disks are double-density, but some are not. A double-density disk will be clearly marked as such. If it is not, don't use it in your drive; it may not record your data reliably.

Write-Protecting Disks

When you write-protect a disk, you prevent information from being "written to" the disk. To "write to" means to put information on the disk; the computer and disk drive work together to record information on the disk. (Similarly, to "read" a disk means to retrieve information recorded on the disk; the drive and computer work together to "load" information into the computer's memory.)

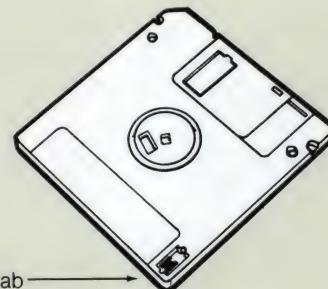
Top of Disk

Write-Protect Notch →



Bottom of Disk

Sliding Tab →



Most disks have a small write-protect notch at the lower left-hand corner of their plastic casing. Turning the disk over, you see a small, sliding tab. To write-protect a disk, slide the tab until you can see through the notch.

If your disk does not have a write-protect notch visible on the lower left-hand corner, you may still be able to write-protect it. On the back of the disk, there should be a sliding tab in the lower right-hand corner. Push the tab to the bottom position to write-protect the disk.

While write-protected, a disk cannot be formatted, erased, or written to. You can move the write-protect tab back to the unprotected position any time you wish to record information on the disk.

Commercial program disks usually do not have write-protect tabs. These disks are permanently write-protected as a safety precaution. For example, the ST Language disk you received with the ST System is permanently write-protected. You cannot format, erase, or write to the ST Language disk.

Before duplicating a disk or copying files from one disk to another, it is recommended that you write-protect the disk you are duplicating or copying files from. Doing so safeguards you against mistakenly inserting your original disk when the drive is ready to write information on the duplicate. Such confusion is likely when you are using a single disk drive to duplicate disks or copy files.

CHAPTER 3

ICONS, WINDOWS, AND FILES

ICONS

The Floppy Disk Icons

When you first switch on your ST Computer, the GEM Desktop displays two Floppy Disk icons in the upper left-hand corner.



The icons themselves don't look like disk drives; instead, they resemble file drawers. Your disks and drive constitute the computer's filing system—the way you store and retrieve information when working with the ST Computer. The Floppy Disk icons allow you to view, control, and manipulate the files stored on the disks.

The Trash Icon

The Trash icon works like a real trash can. When you want to delete a file from a disk, drag the item to the Trash icon. The Delete Box then appears, and you can instruct the computer to erase the file.



Warning: The Trash icon works more like an incinerator than a trash can. Once you throw something away, it's gone forever. You can't reach back in and pull it out again.

WINDOWS AND FILES

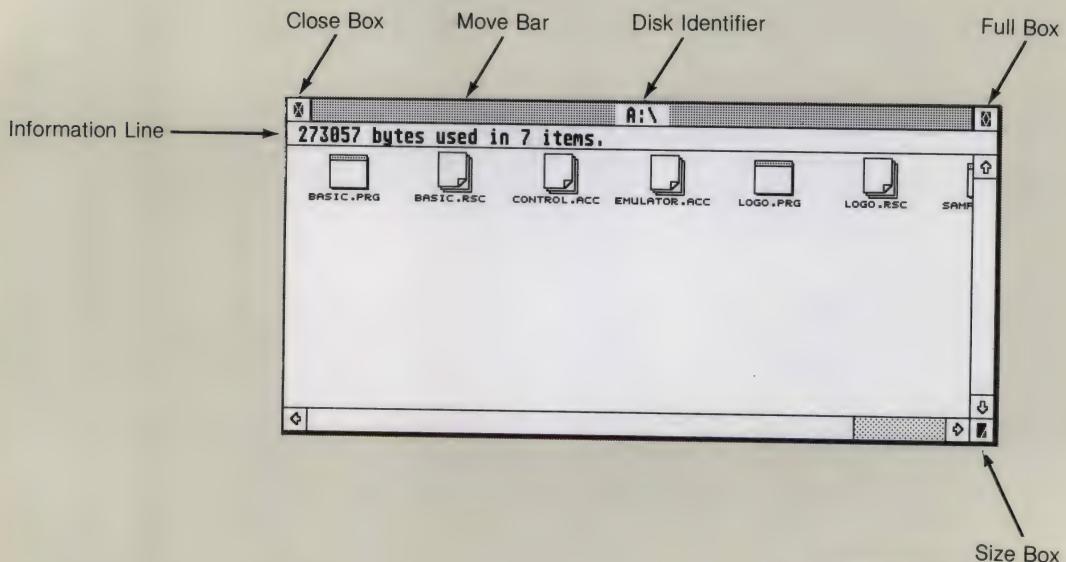
On most computers, all the activity takes place on the full video display screen. On the ST Computer, much of the activity takes place in areas called "windows." Windows are miniature screens within the larger video screen that display the files on your disks, among other things. The GEM Desktop allows you to have up to four windows open at a time.

Note: The open windows in this manual are examples only. The copy you made of your ST Language disk may show a different number of bytes used and different files.

Opening Windows

There are two methods of opening a window. The first method is one you've already used—selecting a Floppy Disk icon, then pointing at and clicking on the Open option under the File Menu.

The second method is called "double-clicking." It is both faster and more convenient than using the Open option. You simply point at a Floppy Disk icon and quickly click the left mouse button twice. With the GEM Desktop displayed and your Working ST Language disk in Drive A, try double-clicking on Floppy Disk A to open its window.



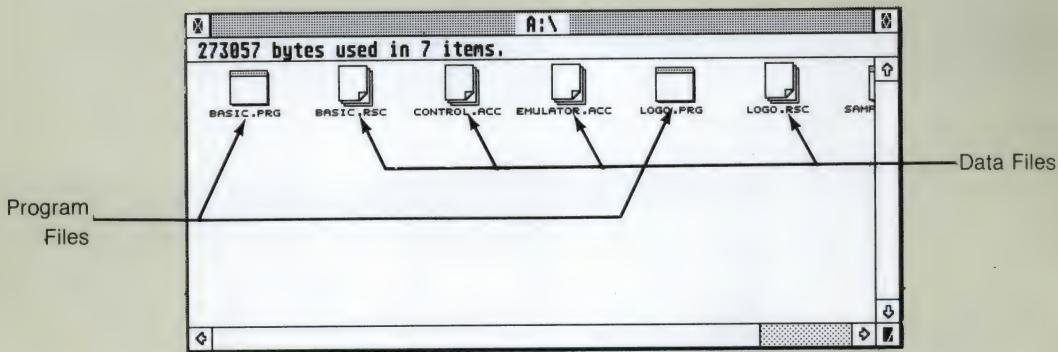
Once Floppy Disk A opens you'll see its file icons and their names, along with the window utilities at the window's top, right, and bottom borders.

The Disk Identifier tells you which disk you've opened (either A or B). The Information Line tells you the sum of the bytes used and in how many items. (To view the remaining storage capacity of a disk, refer to "Show Info" in Chapter 4.)

A window is active when the Move Bar (along the top edge) is shaded and the Scroll Bars (along the right and bottom edges) contain the Scroll Arrows and utility boxes. An active window can be sized, moved, dragged, or have its contents scrolled (see the following sections). Only one window can be active at a time. If you have more than one window open, you can make any open window active by pointing at and clicking on it.

Types of Files

Your ST Computer stores two types of files on disk: data files and program files.



The icons that look like sheets of paper with a corner folded over represent data files. These files contain data that are used by application programs.

The icon without the folded corner is a program file. Program files contain programs.

A third icon, not shown here, looks like a file folder. Folders may contain several files, and provide a way to group related files on your disks. (For more information, see "New Folder" in Chapter 4.)

Opening (Running) Files

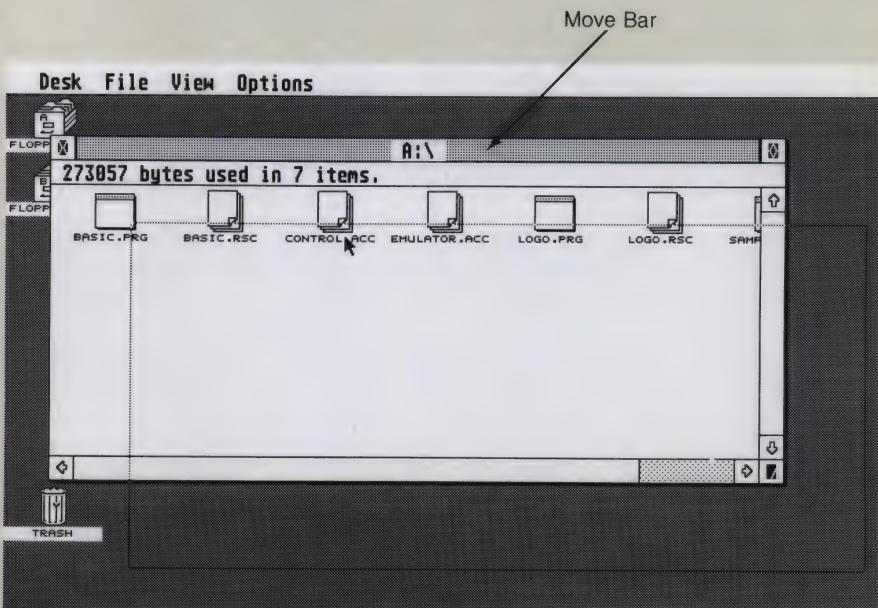
There are two methods of opening a file from the GEM Desktop. The first method is to select the file's icon, then point to and click on the Open option under the File Menu. The second method is to double-click on the file's icon.

Try double-clicking on the file SAMPLE.PRG. The icon will open into a window, and the program will start. This demonstration program lets you practice your window sizing, moving, and closing skills. To exit from the program, close the program's window.

You can only print or display a data file; a Dialog box informs you of this, if one is ever opened.

Moving Windows

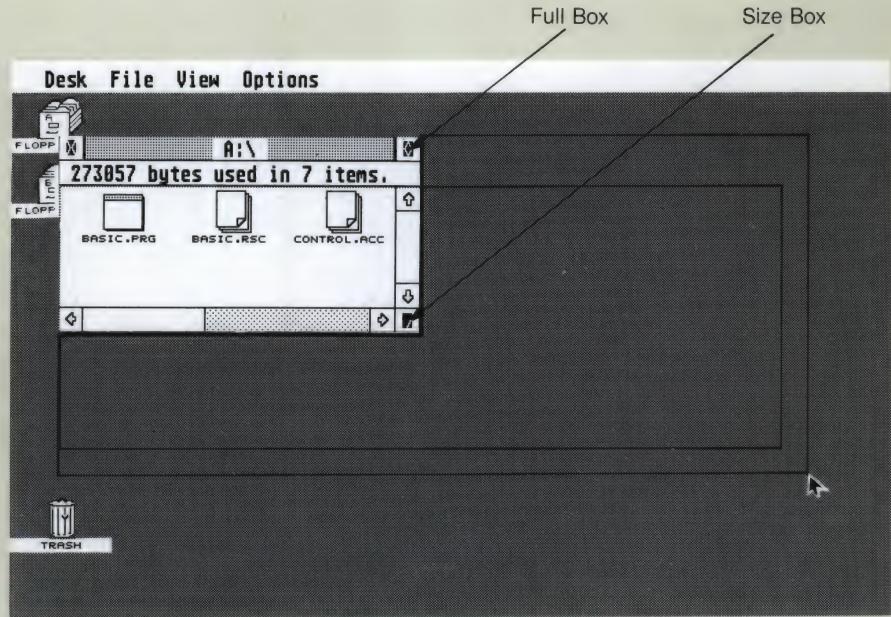
You can move a window to any position on the GEM Desktop by using the Move Bar located on the top edge of a window. To move a window, point at the Move Bar, press and hold the left mouse button, then drag the window to any location on the GEM Desktop and release the button. The window pops into its new position.



Moving windows is especially useful when you need to position more than one open window on the GEM Desktop (for example, as you copy files from one window to another).

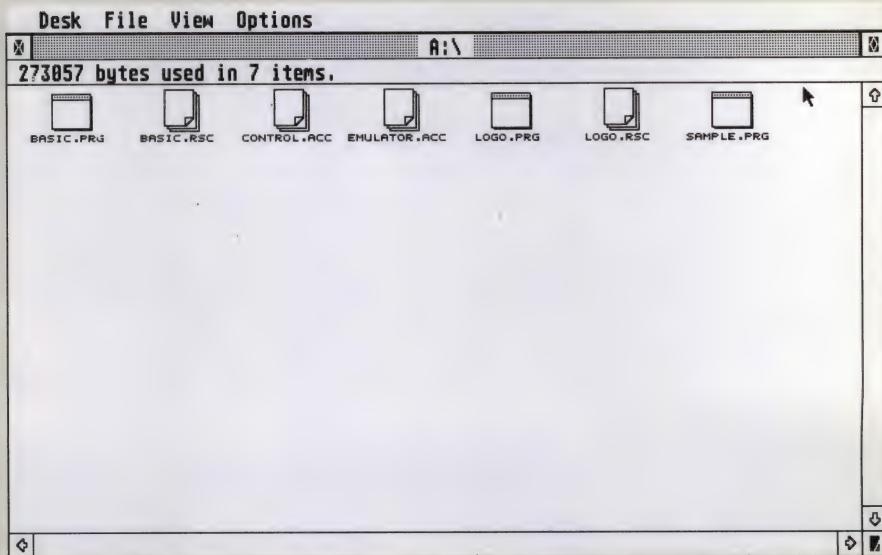
Sizing Windows

You can make a window any size you want. First point at the small box called the Size Box in the lower right-hand corner of the window, then press and hold the left mouse button. Now drag the Size Box in the desired direction—move down to lengthen the window; up to shorten it; right to widen it; and left to narrow it.



Sizing windows is also useful when you need to position more than one open window on the GEM Desktop (for example, as you copy files from one window to another).

A quick way to enlarge a window is to point to and click on the small box called the Full Box in the upper right-hand corner of the window. When you click on this box, the window expands to fill the entire screen. Clicking on the Full Box again returns the window to its previous size, shape, and position on the GEM Desktop.

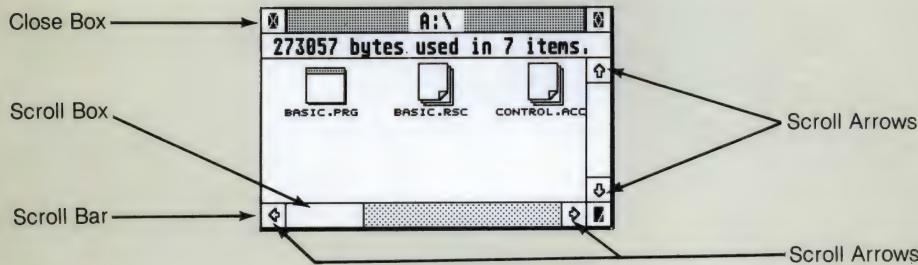


Scrolling Windows

If you want to see items that may be cut off at the edges of a window, but there isn't enough room to enlarge that window, you can "scroll" the contents of the window. The two Scroll Bars—one along the right and the other along the bottom edge of the window—will scroll the contents to the right or left, or up and down.

A portion of the Scroll Bar will be shaded when files are hidden that you might not otherwise notice or remember. If shaded, the arrows indicate in which direction the unseen items sit. The unshaded portion of the Scroll Bar is proportionate to the fraction of the total that you currently see; likewise, the shaded portion is proportionate to the fraction of the total that is hidden. If no part of the Scroll Bar is shaded, then no items are hidden from view.

To scroll, point at the arrow indicating the direction of the hidden contents, then click the left mouse button. Clicking on the arrows moves the display by one "unit" (icon).



There are two other ways to scroll the contents of a window. One is to drag the Scroll Bar's unshaded portion up or down (vertical Scroll Bar) or left or right (horizontal Scroll Bar). A second method is to click on the shaded areas of the Scroll Bars. Clicking on the shaded areas moves the display one "view-unit" (the currently visible area's size).

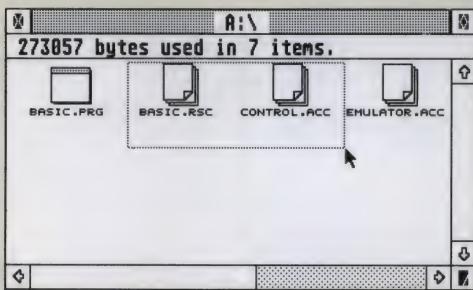
Closing Windows

To close a window, click on the small box called the Close Box in the upper left-hand corner of the window. The window will immediately close and return you to another window, if one is on screen, or to the GEM Desktop. (For more information, see "Close and Close Window" in Chapter 4.)

Multiple Selections

Sometimes you will want to select more than one icon. As you have seen, however, once you click on an icon, clicking anywhere else on the screen cancels your first selection.

There are two methods of selecting more than one icon. The first is to press and hold the left mouse button while the mouse pointer is to the left of the icons you want to select (nearby but not touching). Then drag the pointer down, to the right, and across the desired icons. As you drag the pointer, a rubber-band-like box will form around the icons, and every icon inside that box will be selected after you release the left mouse button. Once the items are selected, hold down the left mouse button while the pointer is on one item in the selected group. Now drag the entire group to where you want it.



The second method for selecting more than one icon is to hold down the [Shift] key on the keyboard while you click on the icons. This is a convenient method when the items are not in sequence and cannot be separated from one another within the pointer's rubber-band box. Once the items are selected, hold down the left mouse button while the pointer is on one item in the selected group. As before, now drag the entire group to where you want it.

Note: Holding down **[Shift]** and clicking on icons actually switches between selected and unselected. That is, if selected, **[Shift]-click** will deselect the item; if unselected, then it will select the item. Sometimes you may find it convenient to combine the two methods of multiple selection: use the pointer's rubber-band box to select, then deselect the undesired items by **[Shift]-clicking** on them.

MANAGING FILES

Copying Files

With many computers, copying files is a complicated process involving numerous commands. On the ST Computer, to copy any type of file, you select that file's icon and drag it to where you want to put the copy. If you want to copy a file onto another disk, simply drag the icon to the icon for that disk, making sure the file's icon is on top of the disk's and that the disk's icon reverses shading.

How to Copy the CONTROL.ACC and EMULATOR.ACC Files

Your Working ST Language disk contains files not essential to the running of the GEM Desktop. The bulk of information on the disk is files that run the two programming languages, ST BASIC and ST Logo, that you received with your ST Computer (see Chapter 5). But the disk also contains two desktop files that you will find handy to have on a separate disk. They are the CONTROL.ACC and EMULATOR.ACC files.

To copy the two files, follow these steps:

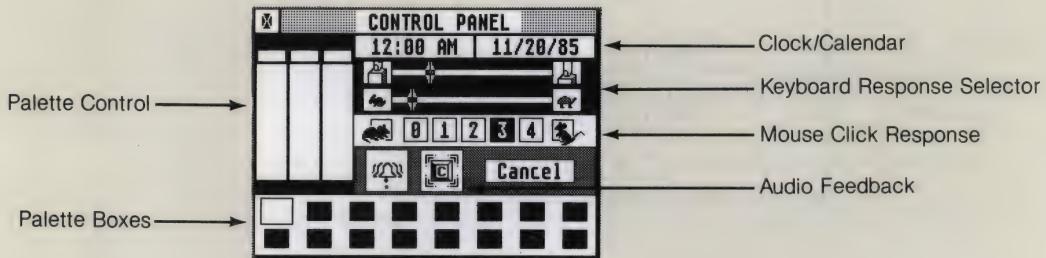
1. Format a new, blank disk. In the Format Box, name the disk "Desktop." You can format it for single- or double-sided recording. (To review the format process, see "How to Format Your Blank Disk" in Chapter 2.)
2. Remove the formatted disk and insert your Working ST Language disk into the drive. (If you have two disk drives, you can leave both disks installed.) Now double-click on Floppy Disk A to open its window.
3. Drag the CONTROL.ACC icon onto the Floppy Disk B icon; the Floppy Disk B icon must reverse shading. Now release the left mouse button. (Or, try selecting and dragging both files to Floppy Disk B at once; see "Multiple Selections.")

To configure the Modem port, press [Help] (see the instructions in the section on the Set RS232 Configuration option). To return to the GEM Desktop, press [Undo].

Control Panel

This option allows you to alter a variety of system features. The Control Panel is a systemwide installation—the panel's settings affect the system as a whole. The Control Panel is divided into five sections: Clock/Calendar, Keyboard Response, Mouse Click Response, Audio Feedback, and Palette Control.

Point to and click on the Control Panel option in the Desk Menu. The Control Panel appears.



Once you've set the Control Panel parameters, click on the Close Box in the upper left-hand corner. To reset the panel to its previous setting, click on the Cancel button (or press [Return]).

Clock/Calendar

To set the clock or calendar, position the mouse pointer in the Clock window (left window) or the Calendar window (right window) and click the left mouse button. The window reverses shading to mark your selection. Use [Backspace] to position the cursor towards the beginning of the block (or [Esc] to erase the block), and enter the correct time or date directly from the ST Computer keyboard. When you finish, click in the Clock or Calendar window again (or press [Return]).

Once you set the time and date, the computer tracks the passage of time as long as it remains switched on. The system uses the Clock/Calendar to note the date and time individual files are

created or revised (see the sections on Show Info and Show As Text). Therefore, if you desire an accurate record of when your files are created or revised, you should reset the Clock/Calendar each time you switch on your computer.

Keyboard Response

Every key (except [Shift], [Control], and [Alternate]) on the ST Computer keyboard will repeat if you continue to hold it down. The Keyboard Response selector controls how soon the keys start repeating and how quickly they repeat.

The Upper Slide (Finger/Key icons) controls how soon the keys begin repeating once the key is held down: moving the slider to the left makes the keys repeat sooner. The Lower Slide (Rabbit and Turtle icons) controls the speed at which the keys repeat once they begin: moving the slider to the left makes the keys repeat faster. These two slides are particularly useful for adjusting the responsiveness of the cursor keys.

To set either slide, select then drag the slider to the desired position and release the left mouse button.

Mouse Click Response

If you do not double-click quickly enough, your computer may interpret the clicks as two separate single clicks. To slacken the computer's double-click response (allowing you to double-click more slowly), select one of the numbered boxes nearer to the Resting Mouse icon.

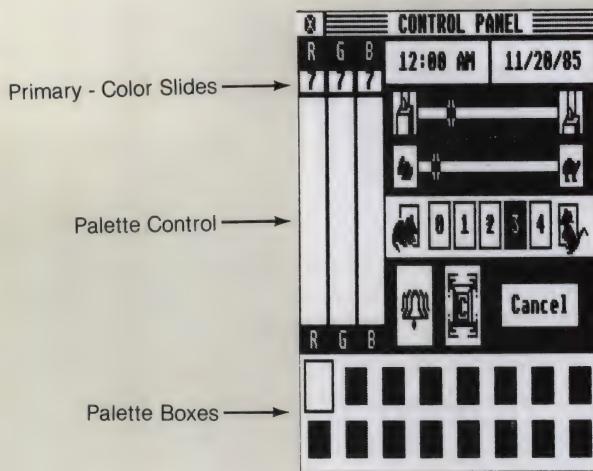
For experienced users, a slower double-click response may be inconvenient. To quicken the computer's double-click response (requiring you to double-click faster), select one of the numbered boxes nearer to the Running Mouse icon.

Audio Feedback

The ST Computer has two kinds of audio feedback: a click after each keystroke and a bell after keyboard and mouse movement errors. (A common mouse movement error occurs when you try to select another function before exiting a Dialog Box.) These sounds are emitted from your monitor's speaker. To activate or deactivate the computer's audio feedback, click on the Keytop icon or the Bell icon. An unshaded icon indicates that the function is active; a shaded icon indicates that it is disabled.

Palette Control

The Palette Control is fully functional only when you use the ATARI SC1224 RGB Analog Color Monitor. However, with the ATARI SM124 High-Resolution Monochrome Monitor you can select either black on white (default) or white on black.



In low-resolution color display mode, the ST Computer can display up to 16 colors at one time. The Palette Control allows you to mix the three primary video colors (Red, Green, and Blue) to make a palette of the colors you want.

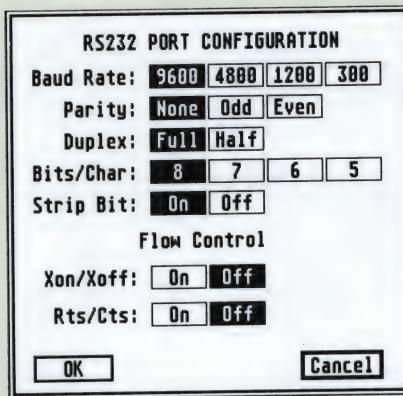
Click on one of the palette colors along the bottom of the Control Panel. To modify the selected color, move any one of the three primary-color sliders to the position you desire. You can move a slider by dragging it or by clicking on the "R," "G," or "B" along the top or bottom of each slide. Each slide has eight positions (0 through 7). Selecting a higher-numbered position increases the primary color's saturation-level relative to the selected palette color.

To invert the current monochrome display, set all sliders to either the top or bottom position.

Set RS232 Configuration

The port labeled "Modem" on the back of the ST Computer is an RS232 serial port. By connecting a modem to your computer you can communicate with other computers. You may also connect a serial printer, or any other RS232 device, to the Modem port.

When you select the Set RS232 Configuration option, the desktop displays the following Dialog Box:



The RS232 Configuration box lets you match the computer's RS232 port with the configuration of the modem (or serial printer) you are using. Refer to your modem manual for specific information on which parameters to choose. The major choices presented to you are explained below.

Baud Rate

Baud rate is the speed at which data is transmitted. (Baud, the standard unit measure of transmission speed, is measured in bits per second.) The fastest rate available to you is 9600 baud; the slowest is 300 baud. You must set the baud rate to accommodate both your modem and the remote computer's modem.

Parity

Whenever computers send information over the telephone lines, there is a chance that some of the information may get garbled, oftentimes due to imperfections and "noise" within telephone lines. Parity is a method that computers use to examine information and determine whether it has been cleanly transmitted. The parity bit is a binary digit added to a group of bits to make the total of all bits odd or even. Depending on your modem and the remote device, you will choose either ODD, EVEN, or NONE.

Duplex

HALF Duplex configures the port for local echo; the characters you type are displayed on screen then sent through the serial port. FULL Duplex configures the port for host echo; the characters you type are sent directly out the serial port, then the host computer "echoes" them back to your computer. Most host computers now allow full-duplex transmission.

Bits/Char

Each character is stored in memory as one byte. A byte is made up of eight bits. Depending on the remote device, you may want to change the number of bits per character when transmitting through the RS232 port.

Strip Bit

This option determines whether the transmitted characters' eighth bit is "stripped" (i.e., set to zero). If your system works correctly with eight bit characters, you'll normally *not* want the eighth bit stripped.

Xon/Xoff and Rts/Cts

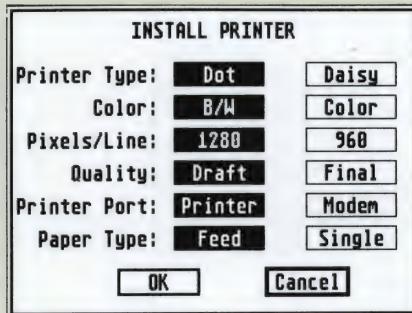
These two choices represent flow control protocols. When transmitting through the RS232 port, your computer and the remote device must be able to tell one another when to start or stop sending information. Choose the flow control that the remote device supports.

Install Printer

This option lets you tell the computer which type of printer you have, as well as which features of the printer you wish the computer to activate when printing.

The Install Printer option is a systemwide installation that provides information to any utility or application. Whether or not a given program checks the Install Printer information before printing depends on the particular program itself. For example, the Print Screen option under the Options Menu on the GEM Desktop uses the Install Printer information, but other utilities or applications may not. Check the manuals that came with your programs to see if they make use of the Install Printer information.

Once you've set the Install Printer parameters, click on the OK button (or Cancel box to exit and void any option just set).



Printer Type

Your choices are Dot (dot matrix printers) and Daisy (daisy wheel printers). Click on the appropriate box according to the type of printer you have.

Color

Your choices are B/W (black and white, that is, monochrome printers) and Color (color printers). Click on the appropriate box according to the type of printer you have.

Pixels/Line

This option is for use with dot matrix graphics printers only. Pixel means picture element. On dot matrix printers, a pixel is a dot. Dot matrix printers print a certain number of pixels (dots) per line when printing in graphics mode. If you have an ATARI Dot Matrix Graphics Printer, choose 1280. If you have an Epson, or Epson-compatible dot matrix graphics printer, choose 960. Both values, 1280 and 960, assume an eight-inch printed line.

Quality

For use with dot matrix printers only. Choose Draft for draft-quality printing. Choose Final for printing that is letter or near-letter quality (your printer must support near-letter-quality printing, of course).

When printing graphics, your printer will make one pass of the print head if set to Draft. For darker graphics, use Final (but keep in mind that the printer will make two passes of the print head, and so take twice as long to produce the graphic).

Printer Port

If you have a parallel printer, choose Printer. Parallel printers connect to the port marked "Printer" on the back panel of your computer. If you are using a serial printer, choose Modem. You should thus have your printer connected to the port marked "Modem" (the RS232 port) on the back of your computer.

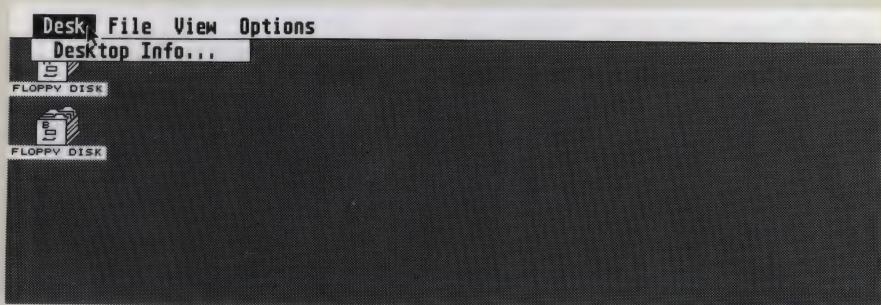
Note: When using a serial printer, be certain you've configured the RS232 port for Xon/Xoff flow control. (See the section on Set RS232 Configuration.)

Paper Type

If your printer feeds paper automatically by means of a tractor or single-sheet feeder, choose Feed. If your printer accepts only a sheet at a time (which you must insert manually), choose Single. The Single option prevents the printer from printing beyond the end of a page should your text run longer than a single sheet.

Switching Your System On Without the Desktop Disk

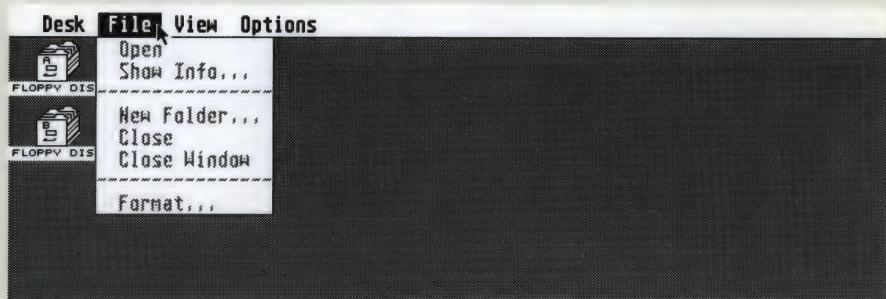
If you switch on your computer without first inserting a disk with the CONTROL.ACC and EMULATOR.ACC files on it, the Desk Menu will contain only one item—Desktop Info.



Doing without the Desk Accessories does free up some of the computer's memory, but usually you'll want the Desk Accessories present. (For more information, see the section on Slow Boot/Fast Boot in Appendix A.)

FILE

The File Menu contains options that allow you to manipulate your files, manage your windows, create folders, and format disks.



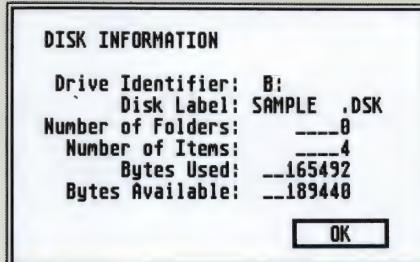
Open

The Open option is used to run a program or reveal the contents of a disk, file, or folder. To begin a program or open a file, select the file, point to the Open option in the File Menu, and click the left mouse button once.

As you have seen, an alternative to the Open option is to point to the file, then quickly double-click the left mouse button.

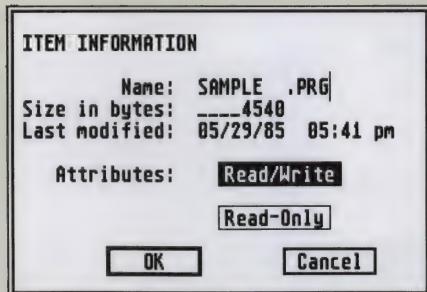
Show Info

When you select a file or desktop icon and then select the Show Info option, the screen displays information about the file or desktop icon you've selected. For example, the Show Info box for a Floppy Disk icon might look like the following:



The Show Info box identifies the disk and gives the number of items stored and the number of bytes both used and available.

The Show Info box for a file might look like the following:



The Show Info box for a file identifies the item and gives the size, date last modified, and its read/write attributes. The Read/Write and Read-Only options allow you to alter a file's read/write attributes. Choose Read/Write if you want to be able to modify ("write to") the file; choose Read-Only if you want the computer to only "read" but not "write to" the file. The Read-Only option protects valuable files from accidental modification.

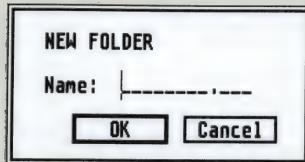
Additionally, you can rename the file within the Show Info box. Press [Backspace] or [Esc] to delete the filename, type a new name, and either press [Return] or click on the OK button to write the new filename on the disk.

Note: Depending on the number and size of your files, the number of bytes used plus the number of bytes available may not equal the exact storage capacity of the disk. This is because the ST Computer reserves at least 1024 bytes on the disk for each file, even if the file is smaller. You should use Show Info's Bytes Available information to monitor your available disk storage space.

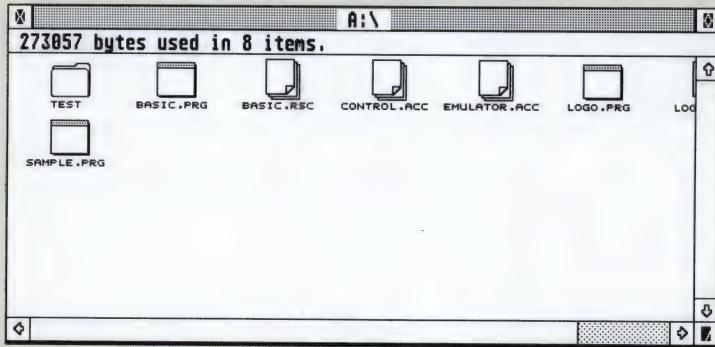
New Folder

Folders are organized collections of files. They are neither programs nor data; you create folders as a means of organizing your files. If you have a window that contains numerous files, it can become difficult to distinguish any one item from the others. Because you may want to organize those files to make them readily accessible, the GEM Desktop allows you to create folders in which to store related files.

To create a folder, open a Floppy Disk icon, then point at the File heading on the Menu Bar and select the New Folder option. The following Dialog Box comes up on your screen:

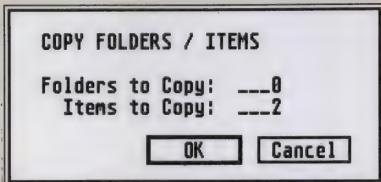
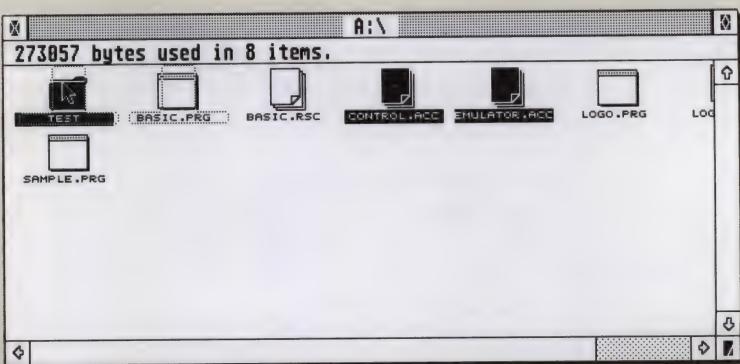


Type in a name for the folder and click on the OK button. If you change your mind about adding a folder, click on the Cancel box instead. Once you give the new folder a name and click on the OK button, the new folder pops into the currently active window.



Note: Folders cannot be renamed.

To put a file into the folder, simply drag it to the folder. When the folder icon highlights, release the left mouse button, then follow the prompts in the Dialog Box and the file will be copied into the folder.



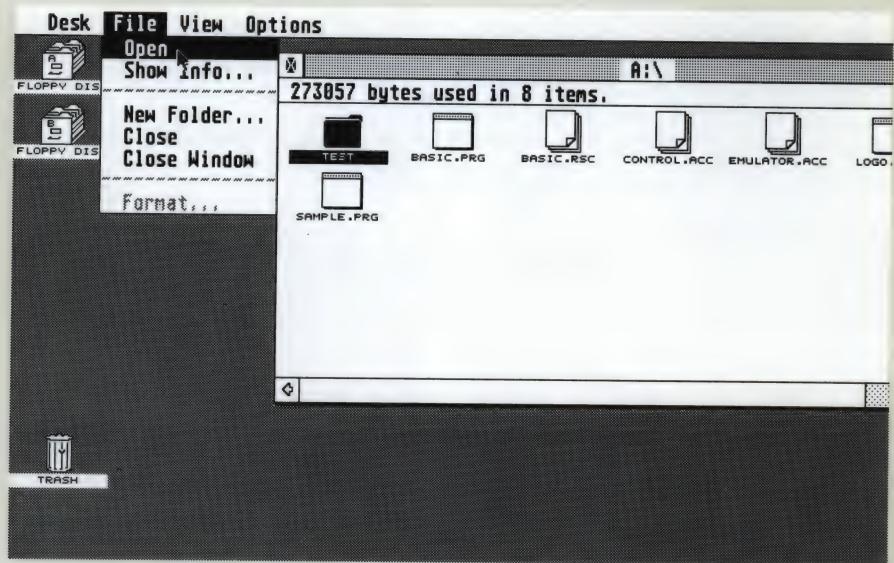
Once you create a folder, you can continue to copy files into it. You can even copy the entire contents of a disk to a folder. Simply drag the Floppy Disk icon to the folder and follow the prompts. This method of duplicating a disk works, provided there's room, when one disk is double-sided and the other disk is single-sided, and vice versa.

Note: Copying a file into a folder creates a new copy of the file and places it in the folder. After you place a copy of the file into a folder, you can delete the old file by dragging its icon onto the Trash icon.

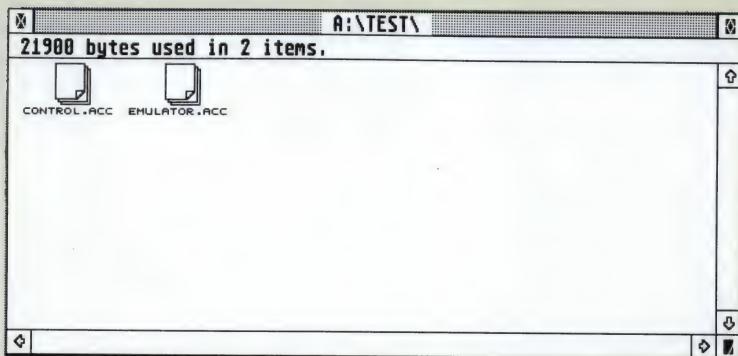
Opening Folders

Every folder may be opened to its own window. If you open a Floppy Disk icon that contains a folder, the window won't immediately reveal the contents of the folder. You must open the folder into its window to view the items it contains.

To open a folder, either double-click on the folder's icon or select the folder (by single-clicking), then choose the Open option under the File heading.



The folder actually opens in the former place of its parent disk's window. Once the folder is opened, its contents can be accessed.



If you wish to open two folders at once (to copy data from one folder to another), open the Disk icon again, then select and open the next folder. Now the screen displays both folders' windows, and you can copy items from one folder to another.

Note: You can also create a folder within a folder, and can continue to do so down to eight levels.

Deleting Folders

When you want to delete a folder, drag it into the Trash icon and follow the instructions on your screen. Keep in mind, however, that all files in the folder are deleted when the folder is deleted.

Close and Close Window

There are three ways to close a window. If you have a window on your screen and you don't want it displayed, you can either select the Close or Close Window options from the File Menu, or you can click on the window's Close Box.

It's always a good idea to close windows if you are not using them. Since you can have four windows open on the GEM Desktop at any one time, any extra open windows only serve to use up available desktop space.

Both the Close and Close Window options shut down only the currently active window, not all the windows on the GEM Desktop. But there is a difference between the two: if a given folder's window is active, the Close option (or Close Box) will close it down and return you to the folder's Floppy Disk window; however, Close Window will at once close down both the folder's window and the Floppy Disk's.

Format

In Chapter 2 you were shown how to format a disk. This section will not take you step-by-step through the process again. Instead, it will review a few important points about disks and formatting them for use.

The surface of a floppy disk is similar to the surface of a record. As with a record, the information that you store on disk is recorded in circular patterns. However, unlike record patterns, disk patterns are not in place when you first buy the disk; you must put them onto the disk before you can use it. Furthermore, a record is mechanically recorded, whereas a disk is magnetically recorded

(more like audio tape). The process of preparing a disk to accept data is called "formatting." To format a disk, select the Floppy Disk icon to be formatted, then select the Format option from the File Menu.

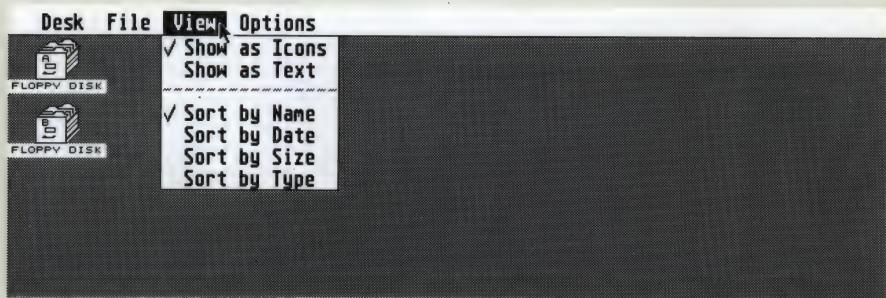
The only chance to name a disk comes in the Format box. Type in the name using the ST Computer keyboard. Use the [Backspace] key to delete any errors. Click on the OK button and the disk will be formatted (and named). A Working box monitors the formatting process.

When the process is complete, a Dialog Box displays the number of bytes available for storage on the disk. If your disk doesn't show 357,376 (single-sided) or 726,016 (double-sided) bytes available, the disk may be defective. Try formatting again. If the problem persists, place a new disk in the disk drive and format it.

Warning: You can reformat old disks, but if you do, any data that was on the disks will be lost—forever. Copy the files you want to save before reformatting the disk.

VIEW

The View Menu allows you to control whether your files will be displayed as Icons or Text, as well as whether they will be sorted (ordered) by Name, Date, Size, or File type.



Note: Any changes you make using the View Menu can be saved to disk. Refer to the Save Desktop section for instructions.

Show as Icons and Show as Text

The check mark in front of the menu item indicates how you will view the file display. To modify how files are displayed, select the option you want by clicking on it. The following two windows show a file display as Icons and as Text for the same disk.

Shown
as Icons



Shown
as Text

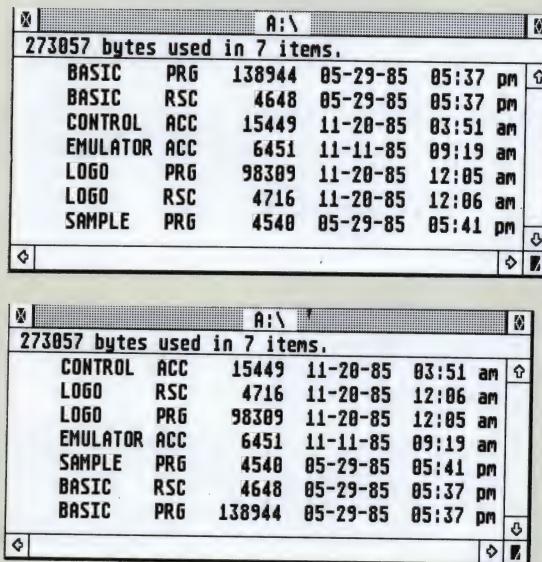
A:\					
273057 bytes used in 7 items.					
BASIC	PRG	138944	05-29-85	05:37 pm	↑
BASIC	RSC	4648	05-29-85	05:37 pm	
CONTROL	ACC	15449	11-20-85	03:51 am	
EMULATOR	ACC	6451	11-11-85	09:19 am	
LOGO	PRG	98309	11-20-85	12:05 am	
LOGO	RSC	4716	11-20-85	12:06 am	
SAMPLE	PRG	4540	05-29-85	05:41 pm	↓

When a file is displayed as text, the window shows the filename and size, as well as the date and time the file was last modified. If there is a small box icon next to a filename in the Text window, it indicates that the file is a folder, not an application or data file.

Sort by Name, Date, Size, and Type

When you open a disk or folder's window, the computer orders the items on screen according to the criterion set with this menu. When Sort by Name is set, files are listed in alphabetical order. Sort by Date lists the files chronologically, with the most recently created or revised file appearing first. When Sort by Size is set, files are listed according to the number of bytes per file, with the largest file appearing first. Sort by Type orders files alphabetically according to their extensions, grouping files with common extensions together.

The screen below shows two windows for the same disk, but one window's files are ordered by Name and the other's by Date.



Sorted by Name

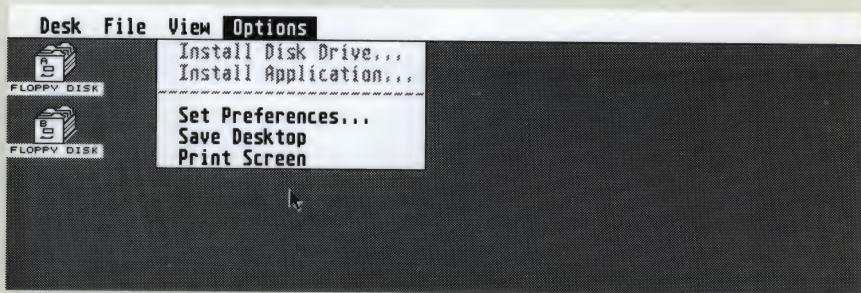
A:\				
273057 bytes used in 7 items.				
BASIC	PRG	138944	05-29-85	05:37 pm
BASIC	RSC	4648	05-29-85	05:37 pm
CONTROL	ACC	15449	11-20-85	03:51 am
EMULATOR	ACC	6451	11-11-85	09:19 am
LOGO	PRG	98309	11-20-85	12:05 am
LOGO	RSC	4716	11-20-85	12:06 am
SAMPLE	PRG	4548	05-29-85	05:41 pm

Sorted by Date

A:\				
273057 bytes used in 7 items.				
CONTROL	ACC	15449	11-20-85	03:51 am
LOGO	RSC	4716	11-20-85	12:06 am
LOGO	PRG	98309	11-20-85	12:05 am
EMULATOR	ACC	6451	11-11-85	09:19 am
SAMPLE	PRG	4548	05-29-85	05:41 pm
BASIC	RSC	4648	05-29-85	05:37 pm
BASIC	PRG	138944	05-29-85	05:37 pm

OPTIONS

The Options Menu includes a variety of useful desktop features.



Note: Any changes you make with the Options Menu can be saved to disk. (See the Save Desktop section.)

Install Disk Drive

When you switch on your ST Computer, the GEM Desktop displays two Floppy Disk icons. Each disk has a disk identifier (a letter) and an icon label. You can change the label, remove a disk icon, or re-install a disk icon with the Install Disk Drive option.

Select a Floppy Disk icon, then select the Install Disk Drive option. The following Dialog Box will be displayed:



To install a new disk icon, select a disk icon, choose Install Disk Drive, then type in the disk identifier (any letter) of the icon you wish to install ("c" stands for Cartridge; "C" for Hard Disk). You may have only two disk icons (A and B) representing your floppy disk drives.

To change the disk label, point at the current name and click the left mouse button; press [Backspace] or [Esc] on the ST Computer keyboard to erase the current name; then type in any name you wish. Click on the Install button.

To remove a disk icon, select the icon, choose Install Disk Drive, then click on the Remove button.

To re-install a disk icon you've removed, select the remaining icon, choose Install Disk Drive, then type in the disk identifier of the missing disk. Click on the Install button.

Warning: Use the Install Disk Drive option with caution. If you remove both disk icons and then save this modified desktop to your Desktop disk, you'll need to make a new Desktop disk to get the disk icons functioning again.

Install Application

With the Install Application option, you can determine the kind of data file that will open an application.

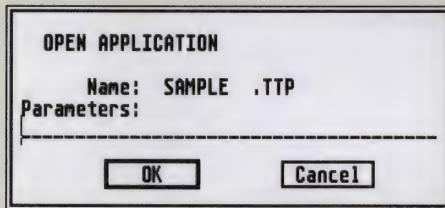
With an application program selected in a window, select the Install Application option from the Options Menu. The following Dialog Box will be displayed:



There are two methods of installing an application. The first method is to tell the computer that you'd like files with a particular filename extension (the three letters that follow the period in a filename), once opened, to automatically run the application program you've installed. For example, suppose you are using ST Logo and thus have procedure files with the filename extension .LOG. You can install Logo to run from this extension. Type LOG after the Document Type option in the Install Application box and click on the OK button. You can now open any procedure file with a .LOG extension and Logo will run automatically, simultaneously loading the file opened.

Choose "GEM" if you have an application that takes advantage of the special windowing features of GEM. Choose "TOS" if the application is not a GEM-compatible program. Most commercial applications will be named to install automatically and correctly.

The second method of installing an application is to use the "TOS-takes parameters" option, provided, again, that your program does not use the features of GEM. In this case you do not need to specify a filename extension. You simply install the application with "TOS—takes parameters," then click on the OK button. When you open the installed application, you see the following Dialog Box:

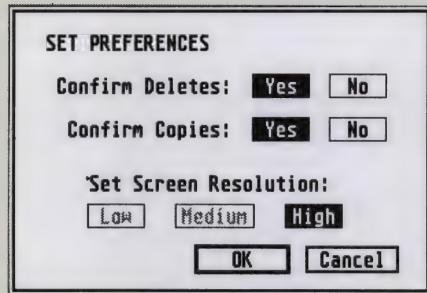


Type in the filename(s) or other parameters the program expects. Click on the OK button. The application program loads and uses the parameters supplied.

Note: The three ways to install an application may be explicit in a given application's filename extension. For instance, .PRG files denote GEM-compatible programs; .TOS denotes non-GEM applications; and .TTP denotes non-GEM, parameter-taking applications.

Set Preferences

The Set Preferences option lets you determine how the ST Computer interacts with you through the prompts and Dialog Boxes, and what resolution your monitor display will be in.



Confirm Deletes and Confirm Copies

These two options determine whether the ST Computer waits for confirmation before deleting a file or making a copy. You can set up the Alert Message system to suit your own needs.

Select Screen Resolution

These parameters provide one of three video screen resolutions: Low, Medium, or High. With the ATARI SM124 Monitor you can select only High Resolution. With the ATARI SC1224 Color Monitor you can select either Medium or Low Resolution.

Warning: If you change screen resolution without a Desktop Disk in Drive A, the Desk Accessories will be erased from memory.

Save Desktop

To save any modification you make to the GEM Desktop, use the Save Desktop option. This is an extremely valuable feature—you can save the desktop format you prefer and have it come up every time you switch on your computer.

Insert your Desktop disk (a disk that contains the CONTROL.ACC and EMULATOR.ACC files) in your drive and click on the Save Desktop option. The computer writes a file called DESKTOP.INF to the disk. Each time you switch on your computer with that disk inserted, the system checks the DESKTOP.INF file and runs the desktop as you have modified it. The size and location of windows and any changes you have made using the Desk, View, or Options Menus are saved to the DESKTOP.INF file.

Print Screen

This option prints the current screen display; it prints everything displayed, including the mouse pointer. You must have a graphics printer connected to your computer to use the Print Screen utility. Make sure the printer is switched on and that it has been installed (see the section on Install Printer). Then click on Print Screen to activate the function.

Additionally, you can rename the file within the Show Info box. Press [Backspace] or [Return] to delete the filename, type a new name, and either press [Return] or click on the OK button to write the new filename on the disk.

Note: If you select the Print Screen utility without first switching on your printer, the system will time-out in approximately 30 seconds.

CHAPTER 5

APPLICATIONS FOR YOUR ST COMPUTER

A computer must be programmed in order to run; otherwise, it's simply a box with microchips. When you first switch on your ST Computer, the GEM Desktop appears on your screen because the desktop program has been permanently encoded into the computer's memory. Permanently encoding the chips inside a computer is one way to make a computer run a program. These encoded chips are the computer's ROM (read only memory) and are programmed at the factory.

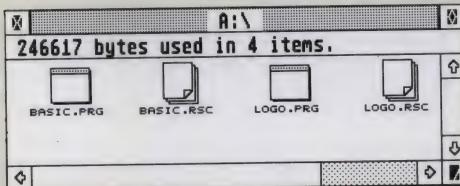
The most common way of running programs, however, is to load them from disk into your computer's memory. These programs are called "applications" (because the computer is "applied" to a certain task.) The world of application programs is unlimited, and varies from word processing to graphics programs, and from spreadsheet and data base management to game programs.

Programming languages, on the other hand, allow you to run programs that you have written using the programming language itself.

The special features and power of the ST Computer are used to full advantage in a number of new application programs and programming languages.

THE ST LANGUAGE DISK

The ST Language disk included with your computer contains two programming languages: ST BASIC and ST Logo. ST BASIC is contained in the program file BASIC.PRG; ST Logo in the program file LOGO.PRG. The data files BASIC.RSC and LOGO.RSC are required by the named languages.



Note: Always use your backup copy of the ST Language disk when working with either ST BASIC or ST Logo.

ST BASIC

BASIC was originally designed as an easy-to-learn, yet powerful, programming language. Today, it remains the most commonly used programming language among microcomputer users. ST BASIC resembles the mainstream dialects of BASIC (as all BASICs do), yet takes advantage of the unique features of the ST Computer.

ST BASIC contains a full complement of string manipulation functions, advanced math features, and print formatting commands. The ST BASIC editor uses the windows and drop-down menus of GEM to full advantage, featuring windows for both text and graphics.

For detailed information on ST BASIC refer to the manual, *ST BASIC Sourcebook*.

ST Logo

Logo is a unique and enchanting programming language, best known for its use with students who are beginning programmers. Logo works with "turtle graphics," a special system in which an imaginary turtle draws lines and shapes under the program's control. Unlike other programming languages, Logo teaches programming through graphics without requiring any understanding of higher math.

ST Logo is an expanded version of the original language. It takes advantage of the mouse, the drop-down menus and windows of GEM, and the speed of the 68000 microprocessor while incorporating an array of new Logo commands not found in any other version of the language. ST Logo represents a new advance in the Logo programming language, specially created to take advantage of the versatility and power of the ST Computer.

For more information on ST Logo, refer to the manual *ST Logo Sourcebook*.

COMMERCIAL APPLICATION PROGRAMS

Many commercial application programs that run on your ST Computer are available. Others are under development at both Atari Corp. and other independent software developers. Look for these new and exciting products at your ATARI Computer retail outlet.

Word Processors

Word processing is one of the most valuable tasks your ST Computer can help you tackle. Word processing programs transform your computer into a super typewriter, and allow you to use it to write letters, term papers, business reports, and the like.

With a word processor you compose text using your computer keyboard just as you would a typewriter. The computer records the typed characters electronically, so you can correct mistakes and make changes before printing your work on paper. You can delete words, phrases, or whole chunks of text; insert new words or phrases; or move blocks of text from place to place within your text—all with only a few keystrokes or mouse clicks.

Word processors let you experiment and arrange your written work on screen using almost any text format. Then you can send your work directly to an ATARI ST Printer. You can also store your work on disk for later reference or revision. One word processing program that uses the capabilities of GEM is *1ST Word™* by GST Software.

Spreadsheet and Data Base Programs

Spreadsheet programs allow you to manipulate on screen an entire worksheet of numbers and formulas, which you can design in various ways: to analyze the stock market, figure your income tax, or calculate your business profits.

Data base programs allow you to compile, store, and retrieve large pools of information. You can then use the program to search the data base for a particular piece of information or for all information meeting some specified criterion, or to sort the information you have stored in a particular way.

Graphics Programs

Business graphics programs enable you to display and print pie charts and line and bar graphs according to values you supply.

Recreational graphics programs, like the paint program NEOchrome™ from Atari Corp., allow you to convert your computer into an artist's canvas and take advantage of the color graphics power of the ST Computer.

APPENDIX A TROUBLESHOOTING AND PREVENTIVE MAINTENANCE

TROUBLESHOOTING

If you run into problems while hooking up or operating your ST Computer, chances are the difficulty is a minor hitch that you can take care of yourself. This section describes some possible problems and suggests simple solutions.

It Just Won't Work

Probably the most common problem is that sometimes the machine just won't work—it just doesn't respond. Usually the remedy is a very simple matter.

If your computer just won't budge (for instance, the screen stays dark), take the following steps:

1. Switch off all parts of your ST Computer system. Now make sure all connections are correct and secure. Check to see that the power cables are connected properly, and that the video cable is plugged in firmly to both the computer and monitor.
2. Switch all components on. Be certain that the computer's front panel power light, the drive's busy light, and the monitor's power light all come on.
3. Check to be sure that the brightness and contrast adjustments on your monitor are turned up. If the display is still not proper, your computer or monitor may need service.

Software Problems

If you are still having difficulty getting the system up and running consistently, it may be that the software application you are using has a few imperfections or that the disk contains garbled data. Try switching your computer off for a few seconds, then on again. If this helps, it may be that the application experienced a momentary

failure, probably due to imperfections in the program itself. If switching the computer off and on doesn't help, try switching on the system using another disk. If this works, the problem is probably with the first disk. But if none of your disks work well, your computer or drive may need repair.

Slow Boot/Fast Boot

If you don't have a disk inserted in the drive when you first switch on the computer, the GEM Desktop takes much longer to appear (about 40 seconds). Once it does appear, you won't have any Desk Accessories available under the Desk Menu. The fastest boot is with a disk that does not have the CONTROL.ACC and EMULATOR.ACC (Desk Accessories) files on it. However, again, you won't be able to access any of the Desk Accessories.

The Mouse

You may eventually have problems controlling the mouse pointer: it may move slowly or sporadically. To solve the problem, first make sure the mouse is plugged firmly into Mouse/Joystick port 0. If the problem persists, see the section on Caring for Your Mouse.

The Keyboard

Don't be concerned that typing on the keyboard produces nothing on screen from the desktop. The GEM Desktop is not an application that permits typing from the keyboard in most instances. When using the desktop, however, you should be able to control the mouse pointer with the cursor keys (see "Controlling the Mouse Pointer with the Cursor Keys" in Chapter 2). When you name files or disks, the desktop will of course permit you to type from the keyboard.

A Final Note

Your ATARI ST Computer system is designed for low maintenance and high reliability. Like anything electronic and mechanical, however, a computer system can break down. If you experience problems that you think may be serious, the best course is to take your computer to your ATARI retailer.

PREVENTIVE MAINTENANCE

To ensure top performance from your ST Computer system, follow the simple guidelines below:

Caring for Your ST Computer System

- Avoid dusty or greasy work areas.
- Avoid smoking near your computer system.
- Keep all components away from extreme heat or moisture.
- Keep liquids away from the components.
- Clean the outside of the components with a soft, lint-free cloth only. Do not use cleansers, abrasives, or solvents, which may damage the components' plastic housings.
- Keep all components out of direct sunlight.
- Always have your system securely placed on a firm, level surface.
- Do not move the components more than necessary.
- When you switch off the computer, wait at least two seconds before you switch it on again.
- To ship or store your system, repack it in the original factory packing materials.

Caring for Your Microfloppy Disks

- Do not switch the disk drive off while it is busy. Do not leave disks in the drive when the drive is off.
- Keep disks away from sources of magnetism (monitor, television, electric motor, or telephone).
- Keep disks away from extreme heat or moisture.
- Never leave disks in direct sunlight.
- Never touch or clean a disk's recording surface inside the plastic housing.

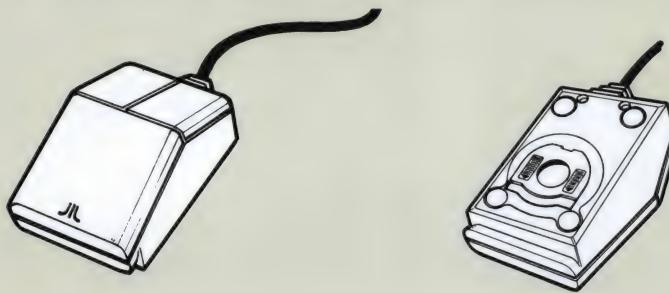
Caring for Your Mouse

Your ST Computer Mouse will last through many years of use if you treat it properly. Two general guidelines for proper mouse care are:

- Don't drop the mouse or allow it to "hang by its tail."
- Make sure the surface on which you use the mouse is as smooth and clean as possible.

Cleaning the Mouse

You'll need to give the mouse a periodic cleaning to ensure proper operation. This is a simple procedure. Follow the steps below.



1. Turn the mouse upside down on your hand with the cable pointing towards you.
2. Place two fingers on the arrow symbols on either side of the roller opening on the bottom of the mouse. Push down and away from you until the panel pops out.
3. Hold one hand over the mouse and turn it over so the ball drops into your hand.
4. Use a soft, dry, lint-free cloth to wipe the ball clean. Never use cleaning fluid. Gently blow into the mouse housing to get rid of any dust.
5. Replace the ball in its housing, then reinsert the retaining panel. When the panel is in place, push it down and backwards until it locks firmly.

APPENDIX B GLOSSARY

Alert Messages Alert Messages inform you that the operation you want to perform is potentially dangerous, improper, or impossible. Alert messages are always displayed in a Dialog Box.

BASIC Beginner's All-Purpose Symbolic Instruction Code. One of the programming languages contained on the ST Language disk.

Baud Rate The speed at which characters are transmitted from one source to another. You can transmit information from your computer through a modem over the telephone lines to another computer. Baud is the standard unit measure of transmission speed calculated in bits per second.

Bit The smallest unit of computer memory. Eight bits equal one byte of memory. (See Byte.)

Boot To switch on your system. Pressing the Reset button on the back panel of the computer "reboots" the system.

Byte Computer memory is arranged into units of bytes. Each byte consists of eight bits, and is a unique character within the computer (e.g. the letter "a" is stored as one byte in memory). (See Bit and Kilobyte.)

Cartridge One of four means of entering data and programs into the ST Computer. The other means are: a disk drive, the keyboard, and an external port (e.g., the Modem port). Cartridges connect to the computer's left side panel.

Click To point the mouse pointer at a word or icon on the screen, press the mouse button, then quickly release it.

Close Box The small box at the upper left-hand corner of a window, used to close an active window.

Color Palette A function of the Control Panel that allows you to modify the colors available on the ST Computer. You must use the SC1224 RGB Analog Color Monitor or a composite monitor for the Color Palette to function fully.

Control Panel A Dialog Box that allows you to control many of the GEM Desktop functions. The Color Palette, Mouse Click Response, Keyboard Response, Clock/Calendar, and Audio Feedback are adjusted with the Control Panel.

Cursor A marker that appears on the screen to indicate the position of the next typed character.

Data File A collection of information used by a program. Data files are not programs. Data file icons look like sheets of paper with one folded corner.

Desk Accessory A Desktop menu option under the Desk heading that can be accessed at most times, either directly from the GEM Desktop or while using some other application.

Desktop Disk Among other things, the ST Language disk contains the data your computer needs to provide a full complement of Desk Accessories. Put a copy of the CONTROL.ACC and EMULATOR.ACC files on another disk. Call this your "Desktop" disk. Use it (or another with those files) when you boot the system.

Dialog Box Dialog Boxes are interactive message boxes. To exit a Dialog Box you must acknowledge the message or choose an option.

Diskcopy A program that makes an exact copy of all of the data on a disk. To make a disk copy, drag the icon of the source disk on top of the icon for the destination disk. The Diskcopy procedure erases all information from the destination disk.

Disk Drive The primary storage device for your ST Computer. The computer uses the disk drive to read information from or write information to a floppy disk. Disk drives are represented by a Floppy Disk icon on the GEM Desktop.

Double-click Two quick clicks on the left mouse button. A double-click opens a file, disk, or folder.

Dragging The technique for moving an item on the desktop, such as an icon, file, or window. Point at the item with the mouse pointer, press the left mouse button, and hold the button down while moving the mouse. While the icon is being dragged, a ghost image of the item you are moving appears on the desktop.

File A collection of information that has been stored or can be stored on a disk or in the computer's memory.

File Copy To copy single files from one disk to another, drag the icons that represent the files you want to copy over to and on top of the new disk's icon. You can also drag files between the opened windows of two disks.

Floppy Disk The medium used to store information. The disk is made of a material similar to audio tape.

Folder A collection of files. Folders provide a way to organize your files on disk. To access a file that has been placed in a folder, double-click on the folder. A folder opens up into its parent window. Folder icons look like file folders.

Format Information is stored on your floppy disks in circular patterns. When you format a disk, you set the patterns so information can then be stored on the disk. Formatting erases all information previously stored on the disk.

Full Box Used to change the size of a window alternately from normal to full-screen.

GEM Graphics Environment Manager. A program used in TOS that creates and manages all the windows, icons, menus, and graphics features of the ST Computer.

GEM Desktop The main screen for the ST Computer. It includes the Menu Bar, two Floppy Disk icons, and the Trash icon.

Ghost An outline of an icon, filename, or window used to show the current position of the item as it is dragged to a new location on the desktop.

Hard Disk A device used to store data on a magnetic surface. The disk itself is permanent (not removable). A hard disk drive can store far more data than a floppy disk drive, and can read and write information many times faster.

High-Resolution One of three video display modes available with the ST Computer. In high-resolution mode, the ST Computer's display consists of 640 dots horizontally by 400 dots vertically. In order to use the high resolution mode, you must have an ATARI SM124 Monochrome Monitor. (See Low-Resolution and Medium-Resolution.)

Icon A picture on the desktop that may represent disks, files, folders, or procedures.

Information Line The line at the top of an active window telling how many bytes are used and in how many items (files).

Input/Output (I/O) The communication process that takes place between the ST Computer and its peripheral devices (i.e., disk drives, printers). Input is information that is sent "in" to the computer; output is information the computer sends "out."

Interface An electronic connection that allows communication between the computer and its peripherals.

Kilobyte (K) 1024 bytes. (See Bit and Byte.)

Logo A powerful graphics programming language contained on the ST Language disk.

Low-Resolution One of three video display modes available with the ST Computer. In low-resolution mode, the ST Computer's display consists of 320 dots horizontally by 200 dots vertically. In this mode, the computer can display up to 16 colors at a time from the total palette of 512 colors.

Medium-Resolution One of three video display modes available with the ST Computer. In medium-resolution mode, the ST Computer's display consists of 640 dots horizontally by 200 dots vertically. In this mode, the computer can display up to four colors at a time from the total palette of 512 colors.

Memory The electronic circuits that the ST Computer uses to store data and programs. There are two kinds of memory: RAM (Random Access Memory) and ROM (Read Only Memory). RAM loses its data if the power is turned off; ROM retains its information whether it has power or not.

Menu Bar A bar at the top of the GEM Desktop. When you first start up the ST Computer System, the headings on the Menu Bar are: Desk, File, View, and Options. Other application programs may have different headings.

MIDI Interface MIDI stands for Musical Instrument Digital Interface. It is a standard interface designed to connect a computer to a number of electronic musical devices.

Modem A device that allows you to connect your computer directly to the telephone lines and establish a communication link with other computers and online information networks.

Mouse The device that controls the movement of the mouse pointer on the desktop. As you slide the mouse across your table or desk, the small rubber ball on the bottom rolls back and forth to track the movements. The mouse has two buttons. The left button is used to select and open files, icons, and programs. The right button is used with some application programs.

Move Bar The bar at the top of an active window. Click on the Move Bar to drag a window to a new location on the desktop.

Parallel Interface An industry-standard interface for high-speed printer connections. On the back of the ST Computer, the parallel interface port is labeled "Printer."

Peripheral Any kind of exterior device that you connect to your computer (i.e., disk drive, monitor, printer).

Pixel The ST Computer video display is made up of tiny dots called "pixels" (picture elements). The pixels are arranged in a grid, and set to either 320 x 200, 640 x 200, or 640 x 400 dots per grid.

Pointer An arrow (also called the "mouse pointer") used to point to objects on the desktop. It follows your movement of the mouse (or cursor keys) forward, backward, left, or right.

Program File A file that contains an application program. Program file icons are boxes shaded at the top.

RAM Random Access Memory. The part of the computer's memory that is used to "write to" and "read information from." When you work with your computer, the display on the screen is in RAM. The information stored in RAM is lost each time you turn off the computer.

RGB Red, Green, Blue. The color signals that the ST Computer produces to create its special color display. The combination of eight different intensities of red, green, and blue enable you to create 512 colors with the ST Computer.

ROM Read Only Memory. The part of the computer's memory containing the boot (startup) information for the computer. ROM is programmed at the factory and never changes.

RS232 The RS232 connector is an industry-standard connection for peripherals. On the back of the ST Computer this connector is labeled "Modem." The RS232 port is also referred to as the serial port. Serial printers may also be connected to the ST Computer through this port.

Scroll To move the information in a window left, right, up, or down.

Scroll Bar One of two bars that border an active window on the bottom and right edges. The Scroll Bars contain the scroll arrows, and are shaded if part of the window's contents cannot be seen. The larger the shaded portion, the greater the percentage of the window's contents that is hidden from view.

Sector A section of a track on a hard or floppy disk. Sectors are usually 128, 256, 512, or 1024 bytes long. On an ST floppy disk, the sectors are 512 bytes long. (See Track.)

Size Box A small box at the lower right-hand corner used to change the size of the window.

Sizing The process of changing the size or shape of a window.

ST Language Disk The disk that came with your computer. It contains ST BASIC, ST Logo, and the Desk Accessories (the CONTROL.ACC and EMULATOR.ACC files). You should make a copy of this disk immediately; label the copy "Working ST Language."

TOS The (ST) Operating System. TOS controls how the computer operates the GEM Desktop, the mouse, and any peripherals you connect to the computer.

Track One of the circular paths on a disk that contains the data written on the disk. Each track is made up of smaller sections called sectors. (See Sector.)

Trash The GEM Desktop icon used to delete files or folders from the desktop. Once a file or folder is put in the Trash icon, it's gone forever.

VT52 (Terminal) Emulator A communications program you can use to turn your ST Computer into a terminal linked to another computer (modem required).

Window The work area that the ST Computer uses to display files and folders or to run programs. The desktop allows up to four windows open at a time.

Working ST Language Disk A copy of your ST Language disk. Make this copy before you do anything else. Always use the copy when you need to access any information contained on the ST Language Disk.

Write-Protect To mechanically prevent a disk from being written to. To write-protect a disk, move the write-protect tab so you can see through the write-protect notch, or so the tab is at the bottom position in the notch.

APPENDIX C

1040ST SPECIFICATIONS

Computer

Processor	MC68000, 32-bit internal, 16-bit external architecture; 8 MHz clock frequency
Memory	1,048,576 bytes of RAM; 196,608 bytes of ROM
Graphics Resolution (selectable)	640 x 400 monochrome 320 x 200 x 16 colors 640 x 200 x 4 colors
Color	Palette of 512 colors
Interfaces	Midi In and Midi Out Ports Monitor Port (RGB Analog; high-resolution monochrome, composite video, and audio) Parallel Interface Printer Port RS232 Serial Modem Port Floppy Disk Port (includes controller) Hard Disk Port (10 megabits per second DMA transfer rate) ROM Cartridge Port (128 kilobytes capacity) Mouse/Joystick and Joystick Ports
Sound Generator	3 voices from 30 Hz to above audible range
Keyboard	94-key intelligent keyboard using 6301 microprocessor
Power Supply (built-in)	+ 5V @ 3A + 12V @ 1A - 12V @ 30mA
Power Consumption	95 watts (maximum)
Ambient Temperature	41° to 113°F (5° to 45°C), operating or idle - 4° to 149°F (- 20° to 65°C), storage - 40 to 149°F (- 40° to 65°C), transport

Relative Humidity
(noncondensing) 20% to 80%, operating or idle
up to 95%, storage or transport

DISK DRIVE

Track Density 135 tracks per inch

Storage Capacity 360 kilobytes per side (formatted MFM);
720 kilobytes total

Storage Medium 3 1/2-inch microfloppy disks; double-sided,
double density; 135 tracks per inch

Head Positioning
Mechanism Step motor

Data Transfer Speed 250 kilobits per second

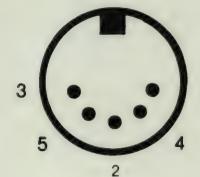
APPENDIX D

CONNECTOR PINOUT SPECIFICATIONS



Midi Out

- 1 — THRU Transmit Data
- 2 — Shield Ground
- 3 — THRU Loop Return
- 4 — OUT Transmit Data
- 5 — OUT Loop Return

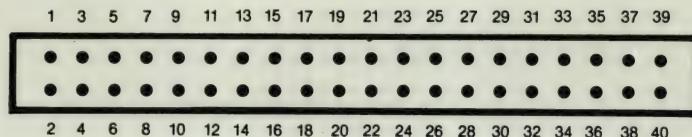


Midi In

- 1 — Not Connected
- 2 — Not Connected
- 3 — Not Connected
- 4 — IN Receive Data
- 5 — IN Loop Return



Cartridge

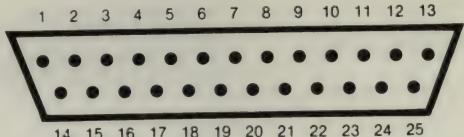


1 — +5 VDC	20 — Address 15
2 — +5 VDC	21 — Address 8
3 — Data 14	22 — Address 14
4 — Data 15	23 — Address 7
5 — Data 12	24 — Address 9
6 — Data 13	25 — Address 6
7 — Data 10	26 — Address 10
8 — Data 11	27 — Address 5
9 — Data 8	28 — Address 12
10 — Data 9	29 — Address 11
11 — Data 6	30 — Address 4
12 — Data 7	31 — ROM Select 3
13 — Data 4	32 — Address 3
14 — Data 5	33 — ROM Select 4
15 — Data 2	34 — Address 2
16 — Data 3	35 — Upper Data Strobe
17 — Data 0	36 — Address 1
18 — Data 1	37 — Lower Data Strobe
19 — Address 13	38-40 — Ground



Modem

- 1 — Protective Ground
- 2 — Transmitted Data
- 3 — Received Data
- 4 — Request to Send
- 5 — Clear to Send
- 6 — Not Connected
- 7 — Signal Ground
- 8 — Data Carrier Detect
- 9-19 — Not Connected
- 20 — Data Terminal Ready

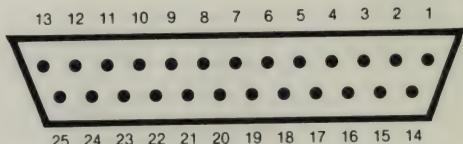


- 21 — Not Connected
- 22 — Ring Indicator
- 23-25 — Not Connected



Printer

- 1 — STROBE
- 2 — Data 0
- 3 — Data 1
- 4 — Data 2
- 5 — Data 3
- 6 — Data 4
- 7 — Data 5
- 8 — Data 6
- 9 — Data 7
- 10 — Not Connected

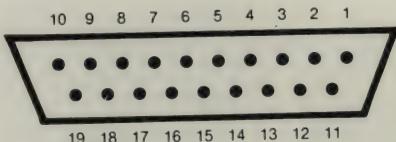


- 11 — BUSY
- 12-17 — Not Connected
- 18-25 — Ground



Hard Disk

- 1 — Data 0
- 2 — Data 1
- 3 — Data 2
- 4 — Data 3
- 5 — Data 4
- 6 — Data 5
- 7 — Data 6
- 8 — Data 7
- 9 — Chip Select
- 10 — Interrupt Request
- 11 — Ground
- 12 — Reset
- 13 — Ground

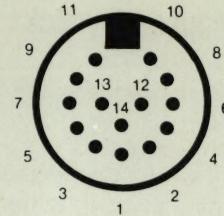


- 14 — Acknowledge
- 15 — Ground
- 16 — A1
- 17 — Ground
- 18 — Read/Write
- 19 — Data Request



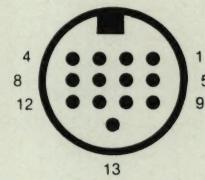
Floppy Disk

- 1 — Read Data
- 2 — Side 0 Select
- 3 — Logic Ground
- 4 — Index Pulse
- 5 — Drive 0 Select
- 6 — Drive 1 Select
- 7 — Logic Ground
- 8 — Motor On
- 9 — Direction In
- 10 — Step
- 11 — Write Data
- 12 — Write Gate
- 13 — Track 00
- 14 — Write Protect



Monitor

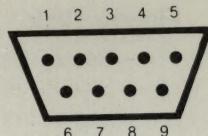
- 1 — Audio Out
- 2 — Composite Video
- 3 — General Purpose Output
- 4 — Monochrome Detect
- 5 — Audio In
- 6 — Green
- 7 — Red
- 8 — Plus 12-Volt Pullup
- 9 — Horizontal Sync
- 10 — Blue
- 11 — Monochrome
- 12 — Vertical Sync
- 13 — Ground





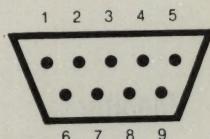
Mouse / Joystick

- 1 — Up/XB
- 2 — Down/XA
- 3 — Left/YA
- 4 — Right/YB
- 5 — Not Connected
- 6 — Fire/Left Button
- 7 — + 5VDC
- 8 — Ground
- 9 — Joy1 Fire/Right Button



Joystick

- 1 — Up
- 2 — Down
- 3 — Left
- 4 — Right
- 5 — Reserved
- 6 — Fire Button
- 7 — + 5VDC
- 8 — Ground
- 9 — Not Connected



Note: All pinout diagrams are from the external port view.



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